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## ATMOSPHERIC ENVIRONMENT FOR SPACE SHUTTLE (STS-7) LAUNCH

By D. L. Johnson, C. K. Hill, and G. W. Batts  
Systems Dynamics Laboratory

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16. ABSTRACT <p>This report presents a summary of selected atmospheric conditions observed near Space Shuttle STS-7 launch time on June 18, 1983, at Kennedy Space Center, Florida. Values of ambient pressure, temperature, moisture, ground winds, visual observations (cloud), and winds aloft are included. The sequence of prelaunch Jimsphere measured vertical wind profiles is given in this report. Also presented are wind and thermodynamic parameters representative of surface and aloft conditions in the SRB descent/impact ocean area. Final meteorological tapes, which consist of wind and thermodynamic parameters versus altitude, for STS-7 vehicle ascent and Acoustic/SRB descent have been constructed. The STS-7 ascent meteorological data tape has been constructed by Marshall Space Flight Center in response to Shuttle task agreement No. 936-53-22-368 with Johnson Space Center.</p>			
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## TECHNICAL MEMORANDUM

### ATMOSPHERIC ENVIRONMENT FOR SPACE SHUTTLE (STS-7) LAUNCH

#### I. INTRODUCTION

This report presents an evaluation of the atmospheric environmental data taken during the launch of the Space Shuttle/STS-7 vehicle. This Space Shuttle vehicle was launched from Pad 39A at Kennedy Space Center (KSC), Florida, on a bearing of 90 deg east of north at 1133 UT (0733 EDT) on June 18, 1983.

This report presents a summary of the atmospheric environment at launch time (L+0) of the STS-7, together with the sequence of prelaunch Jimsphere measured winds aloft profiles from L-14 hr through liftoff. The general weather situation for the launch and flight area is described, and surface and upper level wind/thermodynamic observations near launch time are given. Surface and upper level wind/thermodynamic parameter estimates are also presented for the Acoustic/SRB descent/impact analyses.

Previous MSFC-related launch vehicle atmospheric environmental conditions have been published as Appendix A of individual MSFC Saturn Flight Evaluation Working Group reports [1]. Office memorandums have been issued for previous flights giving launch pad wind information. A report has also been published [2] which summarizes most launch atmospheric conditions observed for the past 155 MSFC/ABMA-related vehicle launches through SA-208 (Skylab 4). Reports summarizing ASTP, STS-1, STS-2, STS-3, STS-4, STS-5, and STS-6 launch conditions are presented in References 3, 4, 5, 6, 7, 8, and 9, respectively.

#### II. SOURCES OF DATA

Atmospheric observational data used in this report were taken from synoptic maps made by the National Weather Service, plus all available surface observations and measurements from around the launch area. Upper air observations were taken from balloon-released instruments sent aloft from Cape Canaveral Air Force Station (CCAFS). High-altitude winds and thermodynamic data were measured by the Super-Loki rocketsondes launched from the CCAFS. Table 1 presents a listing of systems used to obtain the upper level wind profiles used in compiling the final ascent meteorological data tape. The L-0 Rawinsonde and Super-Loki rocket data were used in the upper level atmospheric regions for the construction of the final Acoustic/SRB descent meteorological data tape. Data cutoff altitudes are also given in Table 1.

#### III. GENERAL SYNOPTIC SITUATION AT LAUNCH TIME

A narrow ridge of high pressure, located along the Atlantic coast, and extending into the Gulf of Mexico, was an atmospheric influence over the Florida peninsula during the early morning launch. Along the peninsula, surface winds were northerly to north-northeasterly, ranging in magnitude from 0 to 10 ft/sec. Two levels of 6/10 total cloud cover was present, along with moderate humidity and warm temperatures

(upper 70's) prevailing throughout the early morning countdown period. Figure 1 gives the surface weather map 27 min after launch. Figure 2 presents the wind flow aloft at the 500 mb level. Westerly to north-westerly winds dominated the flow aloft over the KSC Florida area.

Cloudiness was mainly prevalent over the KSC launch complex and adjacent ocean areas as shown in Figure 3. Figure 3 presents the GOES-5 visible picture taken 3 min prior to launch (1130 UT). Broken skys consisting of 4/10 cumulus clouds at 2600 ft and 2/10 stratocumulus at 5000 ft were present during launch. Figure 4 shows an up-close visible shot of the Florida peninsula as recorded by GOES-5, taken at 1130 UT.

#### IV. SURFACE OBSERVATIONS AT LAUNCH TIME

Surface observations at launch time for selected KSC locations are given in Table 2. Included are pad 39A, Shuttle runway, and CCAFS balloon release station observations. Neither precipitation nor lightning was observed at launch time.

Table 3 presents Pad 39A wind data along with other standard hourly meteorological measurements and sky observations for the 6-hr period prior to launch of STS-7. Values for wind speed and direction are given for the 84 m (275 ft) FSS reference level and 18 m (60 ft) pad light pole level.

#### V. UPPER AIR MEASUREMENTS DURING LAUNCH

The FPS-16 Jimsphere (1150 UT), MSS Rawinsonde (1137 UT), Super-Loki rocket-sonde (1340 UT), and Super-Loki Robin (1235 UT) systems were used to measure the upper level wind and thermodynamic parameters for STS-7 launch. At altitudes above the rocket-measured data, the Global Reference Atmosphere (GRA) [10] parameters for June KSC conditions were used. A tabulation of the STS-7 final meteorological data for ascent is presented in Table 4 which lists the wind and thermodynamic parameters versus altitude. A brief summary of parameters is given in the following paragraphs.

##### A. Wind Speed

At launch time, wind speeds were 5.9 ft/sec (3.5 kn) at 60 ft and increased to a maximum of 76 ft/sec (45 kn) blowing from 278 deg. This maximum occurred at an altitude of 45,900 ft (13,990 m). The winds decreased above this level and then became stronger again at much higher levels, as shown in Figure 5. The overall maximum measured speed was 241 ft/sec (143 kn) at 203,000 ft (61,874 m) altitude.

##### B. Wind Direction

At launch time, the 60-ft wind direction was from the north-northeast (10 deg) and shifted through the north to a westerly component above 15,000 ft (4572 m). The winds then shifted into the summer-easterly regime above 60,000 ft (18,288 m). Figure 5 shows the complete wind direction verses altitude profile. As shown in Figure 5, wind directions became quite variable at altitudes with low wind speeds.



### C. Prelaunch/Launch Wind Profiles

Prelaunch/launch wind profiles presented in Figures 6 through 9 were measured by the Jimsphere FPS-16 system. Data are shown for five measurement periods beginning at L-14 hr and extending through L+0.

The wind speed and direction profiles for the 14-hr period prior to and including L+0 are shown in Figures 6 and 7. The in-plane (right crosswind) and out-of-plane (left crosswind) profiles are given on Figures 8 and 9. The wind speeds and component speeds were not significantly different from the June mean values in the 30,000 to 40,000 ft layer during the period for which data are shown.

### D. Thermodynamic Data

The thermodynamic data taken at STS-7 launch time, consisting of atmospheric temperature, dew-point temperature, pressure, and density have been compiled as the STS-7 ascent meteorological data and are presented in Table 4. The associated thermodynamic data taken in support of the acoustic and SRB descent have also been assembled as the STS-7 Acoustic/SRB descent meteorological data and are presented in Table 5. The vertical structure of temperature for the STS-7 ascent and for the SRB descent is shown graphically versus altitude in Figure 10.

The atmospheric thermodynamic parameters of temperature, pressure, and density, measured during STS-7 launch below 228,000 ft (69,494 m) were all within 5 percent of their respective PRA-63 [11] annual values. All these parameters stayed within 18 percent of their respective PRA-63 values, at all levels.

### E. SRB Upper Air and Surface Measurements

As has been mentioned in earlier paragraphs, an Acoustic/SRB descent meteorological data tape has also been constructed which consists of data taken from the MSS-Rawinsonde system (1137 UT) and Super Loki Rocketsonde data measured from the CCAFS. Since the U.S. Naval Ship Vandenberg or Redstone were not supporting this launch, the surface measurements taken from the ship (measuring acoustics) stationed in the Atlantic approximately 40 miles downrange were used. The GRA model data were used at altitude levels above the measured rocketsonde data. The tabular values for the Acoustic/SRB descent meteorological tape are presented in Table 5, with wind speed and direction profiles presented in Figure 11. Figure 10 gives the vertical temperature profile.

## VI. ATMOSPHERIC SUMMARY CONDITIONS FOR STS LAUNCHES

Given in Table 6 are selected atmospheric L+0 launch conditions for all the Space Shuttle launches.

TABLE 1. SYSTEMS USED TO MEASURE UPPER AIR WIND  
DATA FOR STS-7 ASCENT\*

Type of Data	Date: June 18, 1983		Portion of Data Used			
	Release Time		Start		End	
	Time (UT) (hr:min)	Time After L+0 (min)	Altitude m (ft)	Time After L+0 (min)	Altitude m (ft)	Time After L+0 (min)
FPS-16 Jimsphere	11:50	17	6 (21)	17	16,764 (55,000)	75
MSS Rawinsonde (Datasonde)	11:37	4	17,069 (56,000)	60	23,165 (76,000)	80
Super-Loki Rocketsonde (Datasonde)	13:40	127	29,870 (98,000)	146	23,470 (77,000)	160
Super-Loki Rocketsonde (Robin)	12:35	62	79,858 (262,000)	63	30,175 (99,000)	73

\*The L-0 Rawinsonde released from CCAFS was used to estimate the upper atmosphere for Acoustic/SRB descent/impact analyses.

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TABLE 2. SURFACE OBSERVATIONS AT STS-7 LAUNCH TIME

Location <sup>a</sup>	Time After L+0 (min)	Pressure (MSL) N/cm <sup>2</sup> (psia)	Temperature °K (°F)	Dew Point °K (°F)	Relative Humidity (%)	Visibility km (miles)	Sky Cover			Wind	
							Cloud** Amount	Cloud Type	Height of Base Meters (ft)	Speed ft/sec (kt)	Direction (deg)
NASA Space Shuttle Runway <sup>e</sup> Winds Measured at 10.4 m (34 ft)	0	10.152 (14.724)	297.0 (75.0)	294.8 (71.0)	87	16 (10)	4	Cumulus	792 (2,600)	5.1 (3.0)	320
							2	Strato-Cumulus	1524 (5,000)		
DCAFS <sup>c</sup> Surface Measurements	0	10.146 (14.716)	295.9 (73.0)	293.7 (69.0)	88	16 (10)	4 2	Cumulus Strato-Cumulus	914 (3,000) 2743 (9,000)	Calm	Calm
Pad 39A Lightpole <sup>d</sup> SE 18 3 m (60.0 ft)	0	10.146* (14.716)	298.2 (77.2)	294.5 (70.5)	80	-	-	-	-	5.9 <sup>b</sup> (3.5)	10 <sup>b</sup>
Pad 39A FSS (Top-SE) 83.8 m (275 ft)	0	-	-	-	-	-	-	-	-	10.3 <sup>b</sup> (6.1)	350 <sup>b</sup>

\*Pad 39A Camera Site 3 barometric pressure instrument appeared to be reading too low. Therefore, the KSC Shuttle runway station pressure value interpolated to 10.146 N/cm<sup>2</sup> at 21 ft above MSL would be more appropriate as the L+0 pad atmospheric pressure measurement.

\*\*Six-tenths total sky cover.

a. Altitudes of measurements are above natural grade, except where noted.

b. Approximately 10 sec. average prior to L+0.

c. Balloon release site.

d. Pad 39A thermodynamic measurements are taken at camera site No. 3, approximately 6.4 m (21 ft) above MSL.

e. Official STS-7 sky observational site.

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TABLE 3. STS-7 PRE-LAUNCH THROUGH LAUNCH KSC PAD 39A METEOROLOGICAL MEASUREMENTS\*

Hourly Atmospheric Measurements							Sky Condition				
18 June 1983 Time UT	Temp. (°F)	Dew Point (°F)	RH (%)	275' Level (SE)**		60' Level (SE)**		Clouds	Total Sky Cover	Vis. (mi)	Other Remarks
				WS Kt	WD°	WS Kt	WD°				
0500	78	67	69	8	080	11	073	1/10 CU at 2,500 ft	1/10	10	
0600	76	66	70	8	080	7	100	1/10 CU at 2,500 ft	1/10	10	
0700	76	67	73	8	090	6	100	clear skys	0/10	10	
0800	76	68	76	10	080	7	080	2/10 CU at 2,000 ft	2/10	10	
0900	76	68	76	10	070	6	070	1/10 CU at 2,000 ft	1/10	10	
1000	76	69	79	8	045	5	045	2/10 CU at 2,000 ft 2/10 SC at 5,000 ft	4/10	10	
1100	76	71	85	9	040	6	045	4/10 CU at 2,200 ft 2/10 SC at 5,000 ft	6/10	10	
L+0*** 1133	77	71	80	6	350	4	010	4/10 CU at 2,600 ft 2/10 SC at 5,000 ft	6/10	10	

\*Hourly observations obtained verbally from CCAFS.

\*\*10 min mean about the hour from pad 39A instrumentation.

\*\*\*L+0 PAD Wind and thermodynamic parameters obtained from HOSC strip charts. SE Anemometers used at 60 and 275 ft levels for L+0 wind conditions (approximately 10 sec average prior to L+0). Pad 39A L+0 atmospheric pressure, at 21 ft (MSL), was 10.146 N/cm<sup>2</sup>. Sea level pressure was 10.152 N/cm<sup>2</sup>.

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TABLE 4. STS-7 FINAL L+0 ASCENT METEOROLOGICAL DATA TAPE

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
00021	001	030	25.1	.1015+04	.1178+04	21.4
000100	007	360	24.9	.1012+04	.1171+04	21.3
000200	009	357	24.7	.1008+04	.1168+04	21.2
000300	009	010	24.5	.1005+04	.1165+04	21.1
000400	004	070	24.3	.1001+04	.1161+04	21.1
000500	006	040	24.1	.9976+03	.1158+04	21.0
000600	008	062	23.9	.9941+03	.1155+04	20.9
000700	009	078	23.6	.9906+03	.1152+04	20.8
000800	005	087	23.4	.9871+03	.1149+04	20.7
000900	006	063	23.2	.9836+03	.1145+04	20.6
001000	008	068	23.0	.9802+03	.1142+04	20.5
001100	007	070	22.7	.9768+03	.1139+04	20.4
001200	008	066	22.4	.9734+03	.1137+04	20.3
001300	006	061	22.2	.9701+03	.1134+04	20.2
001400	004	056	21.9	.9667+03	.1131+04	20.1
001500	009	068	21.6	.9634+03	.1128+04	20.0
001600	009	070	21.3	.9601+03	.1125+04	19.9
001700	007	073	21.0	.9568+03	.1123+04	19.4
001800	006	062	20.8	.9535+03	.1120+04	19.7
001900	007	049	20.5	.9502+03	.1117+04	19.6
002000	009	053	20.2	.9469+03	.1114+04	19.5
002100	010	066	20.0	.9436+03	.1111+04	19.3
002200	009	066	19.8	.9403+03	.1108+04	19.1
002300	007	070	19.7	.9370+03	.1105+04	18.9
002400	007	051	19.5	.9337+03	.1102+04	18.7
002500	010	053	19.3	.9304+03	.1099+04	18.6
002600	011	058	19.1	.9271+03	.1096+04	18.4
002700	012	063	18.9	.9239+03	.1092+04	18.2
002800	008	075	18.8	.9206+03	.1089+04	18.0
002900	011	077	18.6	.9174+03	.1086+04	17.8
003000	011	086	18.4	.9141+03	.1083+04	17.6
003100	009	087	18.2	.9109+03	.1080+04	17.3
003200	010	060	18.1	.9077+03	.1077+04	17.1
003300	010	059	17.9	.9045+03	.1074+04	16.8
003400	008	061	17.7	.9013+03	.1071+04	16.5
003500	008	051	17.5	.8981+03	.1068+04	16.3
003600	010	054	17.4	.8949+03	.1065+04	16.1
003700	011	070	17.2	.8917+03	.1062+04	16.0
003800	011	060	17.0	.8886+03	.1059+04	15.7
003900	012	054	16.9	.8854+03	.1056+04	15.4
004000	012	071	16.7	.8823+03	.1053+04	15.2
004100	013	077	16.5	.8792+03	.1050+04	14.9
004200	015	077	16.4	.8760+03	.1047+04	14.5
004300	020	076	16.2	.8729+03	.1044+04	14.2
004400	020	079	16.0	.8698+03	.1041+04	13.8
004500	015	086	15.9	.8667+03	.1038+04	13.5
004600	018	071	15.7	.8636+03	.1035+04	13.1
004700	020	075	15.5	.8605+03	.1032+04	12.7
004800	019	064	15.3	.8575+03	.1029+04	12.4
004900	019	064	15.2	.8544+03	.1026+04	12.0

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TABLE 4. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
005000	021	063	15.0	.8514+03	.1023+04	11.3
005100	018	063	14.9	.8483+03	.1020+04	11.2
005200	022	066	14.7	.8453+03	.1017+04	11.1
005300	021	064	14.6	.8422+03	.1014+04	11.0
005400	017	074	14.4	.8392+03	.1011+04	10.9
005500	018	079	14.3	.8362+03	.1008+04	10.8
005600	019	070	14.1	.8332+03	.1005+04	10.7
005700	014	065	14.0	.8302+03	.1001+04	10.6
005800	013	070	13.8	.8272+03	.9984+03	10.5
005900	011	047	13.7	.8243+03	.9954+03	10.4
006000	012	051	13.5	.8213+03	.9924+03	10.3
006100	010	040	13.5	.8183+03	.9889+03	9.5
006200	015	042	13.6	.8154+03	.9855+03	8.8
006300	020	044	13.6	.8125+03	.9821+03	8.0
006400	021	045	13.7	.8096+03	.9786+03	7.2
006500	023	041	13.7	.8067+03	.9752+03	6.5
006600	022	044	13.7	.8038+03	.9718+03	5.7
006700	023	040	13.8	.8009+03	.9684+03	4.9
006800	025	044	13.8	.7980+03	.9649+03	4.1
006900	022	043	13.9	.7951+03	.9615+03	3.4
007000	022	042	13.9	.7923+03	.9581+03	2.6
007100	021	044	13.7	.7894+03	.9554+03	2.2
007200	020	037	13.5	.7866+03	.9526+03	1.7
007300	022	039	13.3	.7837+03	.9499+03	1.3
007400	019	038	13.1	.7809+03	.9472+03	.9
007500	019	038	13.0	.7781+03	.9445+03	.5
007600	017	043	12.8	.7753+03	.9418+03	.0
007700	016	037	12.6	.7725+03	.9391+03	.0
007800	021	033	12.4	.7697+03	.9364+03	.8
007900	020	035	12.2	.7659+03	.9337+03	.1
008000	014	033	12.0	.7641+03	.9310+03	.7
008100	019	033	11.9	.7613+03	.9280+03	.2
008200	017	038	11.8	.7586+03	.9251+03	.3
008300	017	031	11.7	.7558+03	.9221+03	.7
008400	017	041	11.6	.7531+03	.9191+03	.4
008500	012	053	11.6	.7503+03	.9162+03	.5
008600	011	042	11.5	.7476+03	.9132+03	.7
008700	013	044	11.4	.7449+03	.9103+03	.6
008800	011	049	11.3	.7422+03	.9073+03	.7
008900	011	029	11.2	.7395+03	.9044+03	.6
009000	014	033	11.1	.7368+03	.9015+03	.3
009100	014	041	11.0	.7341+03	.8986+03	.8
009200	012	044	10.8	.7314+03	.8958+03	.9
009300	011	028	10.7	.7288+03	.8930+03	.3
009400	014	032	10.6	.7261+03	.8902+03	.6
009500	012	047	10.5	.7235+03	.8873+03	.9
009600	010	039	10.3	.7208+03	.8845+03	.3
009700	012	044	10.2	.7182+03	.8817+03	.6
009800	012	051	10.1	.7156+03	.8790+03	.9
009900	009	036	9.9	.7130+03	.8762+03	.3

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TABLE 4. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
010000	012	023	9.6	.7104+03	.8734+03	-11.6
010100	008	042	9.6	.7077+03	.8707+03	-11.5
010200	008	029	9.5	.7051+03	.8680+03	-11.4
010300	011	029	9.3	.7026+03	.8654+03	-11.3
010400	011	037	9.1	.7000+03	.8627+03	-11.2
010500	008	023	9.0	.6974+03	.8600+03	-11.1
010600	008	020	8.8	.6949+03	.8574+03	-11.1
010700	004	039	8.6	.6923+03	.8547+03	-11.0
010800	003	357	8.4	.6898+03	.8521+03	-10.9
010900	005	003	8.3	.6872+03	.8495+03	-10.8
011000	001	331	8.1	.6847+03	.8468+03	-10.7
011100	003	290	7.9	.6822+03	.8442+03	-10.7
011200	005	345	7.8	.6797+03	.8415+03	-10.6
011300	002	350	7.6	.6772+03	.8388+03	-10.6
011400	003	321	7.5	.6747+03	.8362+03	-10.6
011500	004	022	7.3	.6722+03	.8335+03	-10.6
011600	003	065	7.2	.6697+03	.8309+03	-10.5
011700	003	046	7.0	.6672+03	.8283+03	-10.5
011800	006	046	6.9	.6648+03	.8256+03	-10.5
011900	004	095	6.8	.6623+03	.8230+03	-10.4
012000	002	032	6.6	.6599+03	.8204+03	-10.4
012100	002	094	6.4	.6574+03	.8180+03	-10.8
012200	001	132	6.2	.6550+03	.8156+03	-11.1
012300	001	040	6.0	.6526+03	.8132+03	-11.5
012400	002	086	5.8	.6501+03	.8108+03	-11.9
012500	001	331	5.6	.6477+03	.8084+03	-12.2
012600	001	027	5.4	.6453+03	.8060+03	-12.6
012700	001	328	5.2	.6429+03	.8036+03	-13.0
012800	004	320	5.0	.6405+03	.8012+03	-13.4
012900	002	321	4.8	.6382+03	.7988+03	-13.7
013000	007	301	4.6	.6358+03	.7965+03	-14.1
013100	007	309	4.5	.6334+03	.7938+03	-14.5
013200	007	289	4.4	.6311+03	.7912+03	-14.9
013300	011	299	4.3	.6287+03	.7885+03	-15.3
013400	010	311	4.2	.6264+03	.7859+03	-15.7
013500	012	297	4.1	.6240+03	.7833+03	-16.1
013600	012	290	4.0	.6217+03	.7806+03	-16.6
013700	007	291	3.9	.6194+03	.7780+03	-17.0
013800	007	294	3.8	.6171+03	.7754+03	-17.4
013900	007	321	3.7	.6147+03	.7728+03	-17.8
014000	005	314	3.6	.6124+03	.7702+03	-18.2
014100	007	319	3.4	.6102+03	.7680+03	-17.8
014200	007	334	3.1	.6079+03	.7658+03	-17.5
014300	005	315	2.9	.6056+03	.7635+03	-17.1
014400	008	333	2.6	.6033+03	.7613+03	-16.7
014500	005	348	2.4	.6010+03	.7591+03	-16.4
014600	005	327	2.2	.5988+03	.7568+03	-16.0
014700	005	345	1.9	.5965+03	.7546+03	-15.6
014800	003	320	1.7	.5943+03	.7524+03	-15.2
014900	004	300	1.4	.5921+03	.7502+03	-14.9

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TABLE 4. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
015000	003	344	1.2	.5898+03	.7480+03	-14.5
015100	001	272	1.0	.5876+03	.7456+03	-14.8
015200	003	296	.9	.5854+03	.7432+03	-15.1
015300	002	253	.8	.5832+03	.7408+03	-15.4
015400	006	242	.6	.5810+03	.7385+03	-15.7
015500	005	259	.5	.5788+03	.7361+03	-15.9
015600	007	237	.3	.5766+03	.7337+03	-16.2
015700	006	261	.2	.5744+03	.7314+03	-16.5
015800	006	262	.0	.5722+03	.7290+03	-16.8
015900	008	282	-.1	.5701+03	.7267+03	-17.1
016000	008	290	-.3	.5679+03	.7243+03	-17.4
016100	009	268	-.4	.5658+03	.7219+03	-17.5
016200	009	276	-.6	.5636+03	.7195+03	-17.7
016300	012	269	-.7	.5615+03	.7172+03	-17.8
016400	011	275	-.8	.5593+03	.7148+03	-18.0
016500	010	263	-.9	.5572+03	.7124+03	-18.1
016600	011	266	-1.1	.5551+03	.7100+03	-18.3
016700	010	254	-1.2	.5530+03	.7077+03	-18.4
016800	013	247	-1.3	.5509+03	.7053+03	-18.6
016900	012	248	-1.5	.5488+03	.7030+03	-18.7
017000	013	234	-1.6	.5467+03	.7007+03	-18.9
017100	013	245	-1.8	.5446+03	.6985+03	-19.2
017200	011	238	-2.0	.5425+03	.6964+03	-19.5
017300	013	234	-2.2	.5404+03	.6942+03	-19.8
017400	011	236	-2.4	.5384+03	.6921+03	-20.1
017500	012	223	-2.6	.5363+03	.6900+03	-20.3
017600	010	233	-2.8	.5343+03	.6879+03	-20.6
017700	009	229	-3.0	.5322+03	.6858+03	-20.9
017800	011	238	-3.2	.5302+03	.6837+03	-21.2
017900	009	243	-3.4	.5282+03	.6816+03	-21.5
018000	011	237	-3.6	.5261+03	.6795+03	-21.8
018100	010	248	-3.7	.5241+03	.6772+03	-22.2
018200	009	237	-3.9	.5221+03	.6750+03	-22.7
018300	010	250	-4.0	.5201+03	.6727+03	-23.1
018400	009	248	-4.2	.5181+03	.6705+03	-23.6
018500	011	244	-4.3	.5161+03	.6683+03	-24.0
018600	010	250	-4.4	.5141+03	.6661+03	-24.5
018700	011	247	-4.6	.5121+03	.6639+03	-24.9
018800	013	267	-4.7	.5102+03	.6617+03	-25.4
018900	012	265	-4.9	.5082+03	.6595+03	-25.8
019000	015	269	-5.0	.5062+03	.6573+03	-26.3
019100	014	273	-5.2	.5043+03	.6552+03	-26.5
019200	015	274	-5.4	.5023+03	.6531+03	-26.8
019300	017	281	-5.5	.5004+03	.6510+03	-27.0
019400	014	278	-5.7	.4984+03	.6490+03	-27.3
019500	015	281	-5.9	.4965+03	.6469+03	-27.5
019600	014	281	-6.1	.4946+03	.6448+03	-27.8
019700	015	272	-6.3	.4927+03	.6428+03	-28.0
019800	017	282	-6.4	.4908+03	.6407+03	-28.3
019900	015	281	-6.6	.4889+03	.6387+03	-28.5



TABLE 4. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
020000	017	274	-6.8	.4820+03	.6366+03	-28.8
020100	015	274	-7.0	.4831+03	.6347+03	-29.0
020200	015	270	-7.2	.4832+03	.6327+03	-29.2
020300	018	274	-7.4	.4813+03	.6307+03	-29.3
020400	015	273	-7.6	.4794+03	.6288+03	-29.5
020500	019	277	-7.8	.4775+03	.6268+03	-29.7
020600	018	282	-8.1	.4757+03	.6249+03	-29.9
020700	018	273	-8.3	.4738+03	.6229+03	-30.1
020800	018	282	-8.5	.4720+03	.6210+03	-30.2
020900	017	279	-8.7	.4701+03	.6191+03	-30.4
021000	018	281	-8.9	.4683+03	.6171+03	-30.6
021100	015	274	-9.1	.4665+03	.6152+03	-30.8
021200	019	279	-9.3	.4646+03	.6133+03	-30.9
021300	017	287	-9.6	.4628+03	.6114+03	-31.1
021400	016	279	-9.8	.4610+03	.6095+03	-31.3
021500	017	288	-10.0	.4592+03	.6077+03	-31.4
021600	016	282	-10.2	.4574+03	.6058+03	-31.6
021700	016	281	-10.4	.4556+03	.6039+03	-31.8
021800	016	277	-10.7	.4538+03	.6020+03	-32.0
021900	017	272	-10.9	.4520+03	.6002+03	-32.1
022000	017	280	-11.1	.4502+03	.5983+03	-32.3
022100	018	278	-11.3	.4484+03	.5965+03	-32.4
022200	020	287	-11.6	.4467+03	.5947+03	-32.6
022300	020	285	-11.8	.4449+03	.5929+03	-32.7
022400	022	289	-12.1	.4431+03	.5912+03	-32.9
022500	021	287	-12.3	.4414+03	.5894+03	-33.0
022600	023	293	-12.6	.4396+03	.5876+03	-33.2
022700	022	293	-12.8	.4379+03	.5858+03	-33.3
022800	023	289	-13.1	.4361+03	.5841+03	-33.5
022900	023	287	-13.3	.4344+03	.5823+03	-33.6
023000	024	280	-13.6	.4327+03	.5806+03	-33.8
023100	027	281	-13.8	.4309+03	.5788+03	-33.1
023200	025	279	-14.1	.4292+03	.5770+03	-32.4
023300	027	279	-14.3	.4275+03	.5752+03	-31.7
023400	027	284	-14.6	.4258+03	.5734+03	-31.0
023500	029	279	-14.8	.4241+03	.5716+03	-30.3
023600	030	284	-15.0	.4224+03	.5698+03	-29.7
023700	028	285	-15.3	.4207+03	.5681+03	-29.0
023800	029	285	-15.5	.4190+03	.5663+03	-28.3
023900	027	283	-15.8	.4173+03	.5645+03	-27.6
024000	030	281	-16.0	.4157+03	.5628+03	-26.9
024100	028	282	-16.2	.4140+03	.5609+03	-26.6
024200	029	280	-16.4	.4123+03	.5591+03	-26.4
024300	027	282	-16.6	.4106+03	.5572+03	-26.1
024400	027	279	-16.8	.4090+03	.5554+03	-25.9
024500	029	281	-17.0	.4073+03	.5536+03	-25.6
024600	026	278	-17.2	.4057+03	.5518+03	-25.3
024700	028	279	-17.4	.4040+03	.5500+03	-25.1
024800	029	285	-17.6	.4024+03	.5482+03	-24.8
024900	028	283	-17.8	.4008+03	.5464+03	-24.6

TABLE 4. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M <sup>3</sup> )	DEW POINT (DEG C)
025000	028	285	-18.5	.3992+03	.5446+03	-24.3
025100	028	285	-18.5	.3992+03	.5446+03	-24.3
025200	029	281	-18.7	.3959+03	.5416+03	-24.4
025300	027	280	-19.0	.3943+03	.5401+03	-24.5
025400	028	280	-19.4	.3927+03	.5386+03	-24.6
025500	028	280	-19.7	.3911+03	.5371+03	-24.6
025600	026	279	-20.0	.3895+03	.5357+03	-24.7
025700	025	278	-20.4	.3879+03	.5342+03	-24.8
025800	023	276	-20.7	.3863+03	.5328+03	-24.9
025900	022	275	-21.1	.3848+03	.5313+03	-24.9
026000	020	273	-21.4	.3832+03	.5298+03	-25.0
026100	019	271	-21.6	.3816+03	.5283+03	-25.2
026200	017	269	-21.9	.3800+03	.5268+03	-25.3
026300	016	266	-22.1	.3785+03	.5248+03	-25.5
026400	018	272	-22.3	.3769+03	.5231+03	-25.7
026500	017	260	-22.5	.3754+03	.5214+03	-25.8
026600	022	268	-22.8	.3738+03	.5197+03	-26.0
026700	020	262	-23.0	.3723+03	.5181+03	-26.2
026800	023	257	-23.2	.3707+03	.5164+03	-26.4
026900	019	257	-23.5	.3692+03	.5148+03	-26.5
027000	022	248	-23.7	.3677+03	.5131+03	-26.7
027100	024	257	-23.9	.3661+03	.5115+03	-26.9
027200	023	249	-24.2	.3646+03	.5098+03	-27.1
027300	026	256	-24.4	.3631+03	.5082+03	-27.3
027400	026	260	-24.7	.3616+03	.5066+03	-27.5
027500	027	259	-24.9	.3601+03	.5050+03	-27.7
027600	025	261	-25.1	.3586+03	.5034+03	-27.9
027700	028	259	-25.4	.3571+03	.5018+03	-28.1
027800	029	266	-25.6	.3556+03	.5002+03	-28.3
027900	028	266	-25.9	.3541+03	.4986+03	-28.5
028000	032	267	-26.1	.3527+03	.4970+03	-28.7
028100	032	266	-26.3	.3512+03	.4954+03	-28.9
028200	034	268	-26.6	.3497+03	.4938+03	-29.2
028300	032	269	-26.8	.3482+03	.4921+03	-29.4
028400	033	266	-27.0	.3468+03	.4905+03	-29.7
028500	032	269	-27.2	.3453+03	.4889+03	-29.9
028600	033	271	-27.5	.3439+03	.4874+03	-30.2
028700	034	269	-27.7	.3424+03	.4858+03	-30.4
028800	031	274	-27.9	.3410+03	.4842+03	-30.7
028900	032	272	-28.2	.3396+03	.4826+03	-30.9
029000	032	273	-28.4	.3381+03	.4810+03	-31.2
029100	031	269	-28.6	.3367+03	.4794+03	-31.5
029200	032	269	-28.8	.3353+03	.4778+03	-31.7
029300	031	268	-29.0	.3338+03	.4762+03	-32.0
029400	033	265	-29.2	.3324+03	.4746+03	-32.3
029500	033	268	-29.4	.3310+03	.4730+03	-32.5
029600	034	266	-29.7	.3296+03	.4714+03	-32.8
029700	036	265	-29.9	.3282+03	.4698+03	-33.1
029800	037	264	-30.1	.3268+03	.4682+03	-33.4
029900	041	259	-30.3	.3254+03	.4666+03	-33.6

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TABLE 4. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	OCN POINT (DEG C)
030000	039	262	-30.5	.3240+03	.4650+03	-33.9
030100	041	258	-30.7	.3227+03	.4634+03	-34.6
030200	039	266	-30.9	.3213+03	.4618+03	-35.3
030300	038	264	-31.0	.3199+03	.4602+03	-36.0
030400	037	263	-31.2	.3185+03	.4585+03	-36.7
030500	035	266	-31.4	.3172+03	.4569+03	-37.4
030600	037	268	-31.6	.3158+03	.4553+03	-38.1
030700	036	272	-31.8	.3145+03	.4537+03	-38.8
030800	035	271	-31.9	.3131+03	.4521+03	-39.5
030900	035	275	-32.1	.3118+03	.4505+03	-40.2
031000	034	273	-32.3	.3105+03	.4490+03	-40.9
031100	033	280	-32.5	.3091+03	.4474+03	-41.1
031200	032	277	-32.7	.3078+03	.4458+03	-41.4
031300	032	277	-32.8	.3065+03	.4442+03	-41.6
031400	031	276	-33.0	.3051+03	.4426+03	-41.9
031500	030	278	-33.2	.3038+03	.4410+03	-42.1
031600	027	280	-33.4	.3025+03	.4395+03	-42.4
031700	028	283	-33.6	.3012+03	.4379+03	-42.6
031800	025	285	-33.7	.2999+03	.4363+03	-42.9
031900	027	283	-33.9	.2986+03	.4348+03	-43.1
032000	026	288	-34.1	.2973+03	.4332+03	-43.4
032100	026	283	-34.4	.2960+03	.4319+03	-43.8
032200	025	285	-34.7	.2948+03	.4306+03	-44.3
032300	025	283	-35.1	.2935+03	.4293+03	-44.7
032400	022	287	-35.4	.2922+03	.4281+03	-45.1
032500	025	283	-35.7	.2909+03	.4268+03	-45.5
032600	024	286	-36.0	.2897+03	.4255+03	-46.0
032700	025	290	-36.3	.2884+03	.4242+03	-46.4
032800	023	286	-36.7	.2871+03	.4229+03	-46.8
032900	025	286	-37.0	.2859+03	.4217+03	-47.3
033000	021	289	-37.3	.2847+03	.4204+03	-47.7
033100	024	284	-37.5	.2834+03	.4190+03	-47.9
033200	022	291	-37.8	.2821+03	.4175+03	-48.0
033300	025	289	-38.0	.2809+03	.4161+03	-48.2
033400	025	298	-38.2	.2797+03	.4147+03	-48.4
033500	025	308	-38.4	.2784+03	.4132+03	-48.5
033600	027	306	-38.7	.2772+03	.4118+03	-48.7
033700	027	304	-38.9	.2760+03	.4104+03	-48.9
033800	028	310	-39.1	.2748+03	.4090+03	-49.1
033900	027	306	-39.4	.2736+03	.4076+03	-49.2
034000	027	309	-39.6	.2724+03	.4062+03	-49.4
034100	025	307	-39.8	.2711+03	.4048+03	-49.7
034200	034	301	-40.1	.2699+03	.4034+03	-49.9
034300	032	302	-40.3	.2687+03	.4020+03	-50.2
034400	033	299	-40.5	.2675+03	.4006+03	-50.5
034500	034	299	-40.7	.2664+03	.3992+03	-50.7
034600	034	293	-41.0	.2652+03	.3979+03	-51.0
034700	036	297	-41.2	.2640+03	.3965+03	-51.3
034800	039	300	-41.4	.2628+03	.3951+03	-51.6
034900	040	298	-41.7	.2616+03	.3937+03	-51.8

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TABLE 4. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
035000	044	297	-41.9	.2605+03	.3924+03	-52.1
035100	044	297	-42.2	.2591+03	.3911+03	-52.3
035200	046	301	-42.4	.2581+03	.3899+03	-52.6
035300	047	299	-42.7	.2570+03	.3885+03	-52.8
035400	047	298	-43.0	.2558+03	.3872+03	-53.0
035500	048	299	-43.2	.2547+03	.3859+03	-53.2
035600	049	296	-43.5	.2535+03	.3846+03	-53.5
035700	051	300	-43.8	.2524+03	.3833+03	-53.7
035800	054	298	-44.1	.2513+03	.3821+03	-53.9
035900	054	298	-44.3	.2501+03	.3808+03	-54.2
036000	053	297	-44.6	.2490+03	.3795+03	-54.4
036100	056	297	-44.8	.2479+03	.3782+03	-54.6
036200	059	299	-45.1	.2468+03	.3769+03	-54.8
036300	059	297	-45.3	.2456+03	.3756+03	-55.0
036400	061	301	-45.6	.2445+03	.3743+03	-55.2
036500	063	303	-45.8	.2434+03	.3729+03	-55.3
036600	064	301	-46.0	.2423+03	.3716+03	-55.5
036700	064	303	-46.3	.2412+03	.3703+03	-55.7
036800	064	302	-46.5	.2401+03	.3691+03	-55.9
036900	063	305	-46.8	.2390+03	.3678+03	-56.1
037000	061	303	-47.0	.2379+03	.3665+03	-56.3
037100	060	304	-47.2	.2368+03	.3652+03	-56.5
037200	057	306	-47.5	.2357+03	.3639+03	-56.7
037300	059	306	-47.7	.2347+03	.3626+03	-57.0
037400	059	307	-48.0	.2336+03	.3613+03	-57.2
037500	060	306	-48.2	.2325+03	.3601+03	-57.4
037600	062	306	-48.4	.2314+03	.3588+03	-57.6
037700	060	306	-48.7	.2304+03	.3575+03	-57.8
037800	064	305	-48.9	.2293+03	.3563+03	-58.1
037900	064	307	-49.2	.2283+03	.3550+03	-58.3
038000	060	308	-49.4	.2272+03	.3538+03	-58.5
038100	060	313	-49.5	.2262+03	.3523+03	-58.6
038200	056	314	-49.6	.2251+03	.3508+03	-58.7
038300	056	310	-49.7	.2241+03	.3493+03	-58.8
038400	055	314	-49.8	.2230+03	.3479+03	-58.9
038500	055	312	-49.9	.2220+03	.3464+03	-58.9
038600	057	313	-50.0	.2210+03	.3450+03	-59.0
038700	054	317	-50.1	.2200+03	.3435+03	-59.1
038800	054	312	-50.2	.2189+03	.3421+03	-59.2
038900	055	314	-50.3	.2179+03	.3407+03	-59.3
039000	053	314	-50.4	.2169+03	.3392+03	-59.4
039100	052	316	-50.6	.2159+03	.3380+03	-59.6
039200	052	319	-50.9	.2149+03	.3368+03	-59.8
039300	054	317	-51.1	.2139+03	.3356+03	-60.1
039400	056	316	-51.3	.2129+03	.3343+03	-60.3
039500	055	318	-51.5	.2119+03	.3331+03	-60.5
039600	055	319	-51.8	.2109+03	.3319+03	-60.7
039700	057	321	-52.0	.2099+03	.3307+03	-60.9
039800	058	319	-52.2	.2090+03	.3295+03	-61.2
039900	060	318	-52.5	.2080+03	.3283+03	-61.4

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TABLE 4. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M <sup>3</sup> )	DEW POINT (DEG C)
040000	063	317	-52.7	.2070+03	.3271+03	-61.6
040100	064	316	-53.0	.2060+03	.3260+03	-61.8
040200	068	318	-53.2	.2051+03	.3249+03	-62.1
040300	071	318	-53.5	.2041+03	.3237+03	-62.3
040400	067	322	-53.8	.2031+03	.3226+03	-62.6
040500	066	323	-54.0	.2022+03	.3215+03	-62.8
040600	066	323	-54.3	.2012+03	.3203+03	-63.1
040700	062	323	-54.6	.2003+03	.3192+03	-63.3
040800	060	325	-54.9	.1993+03	.3181+03	-63.6
040900	058	322	-55.1	.1984+03	.3170+03	-63.8
041000	052	322	-55.4	.1975+03	.3159+03	-64.1
041100	051	320	-55.4	.1965+03	.3145+03	-64.2
041200	045	319	-55.5	.1956+03	.3130+03	-64.3
041300	047	316	-55.5	.1947+03	.3116+03	-64.3
041400	047	312	-55.6	.1937+03	.3102+03	-64.4
041500	043	313	-55.6	.1928+03	.3088+03	-64.5
041600	043	310	-55.7	.1919+03	.3074+03	-64.6
041700	044	313	-55.7	.1910+03	.3060+03	-64.7
041800	043	313	-55.8	.1901+03	.3047+03	-64.7
041900	043	307	-55.8	.1892+03	.3033+03	-64.8
042000	042	309	-55.9	.1883+03	.3019+03	-64.9
042100	046	303	-56.0	.1874+03	.3006+03	-65.0
042200	046	308	-56.1	.1865+03	.2993+03	-65.1
042300	042	314	-56.2	.1856+03	.2980+03	-65.1
042400	044	308	-56.3	.1847+03	.2967+03	-65.2
042500	045	305	-56.4	.1838+03	.2955+03	-65.3
042600	045	310	-56.5	.1830+03	.2942+03	-65.4
042700	043	308	-56.6	.1821+03	.2929+03	-65.5
042800	047	305	-56.7	.1812+03	.2917+03	-65.5
042900	046	300	-56.8	.1804+03	.2904+03	-65.6
043000	045	299	-56.9	.1795+03	.2892+03	-65.7
043100	044	301	-57.0	.1786+03	.2880+03	-65.8
043200	043	302	-57.2	.1778+03	.2868+03	-66.0
043300	039	299	-57.3	.1769+03	.2856+03	-66.1
043400	043	299	-57.5	.1761+03	.2845+03	-66.3
043500	045	296	-57.6	.1752+03	.2833+03	-66.4
043600	046	297	-57.8	.1744+03	.2821+03	-66.6
043700	046	299	-57.9	.1736+03	.2810+03	-66.7
043800	045	296	-58.1	.1727+03	.2798+03	-66.9
043900	046	293	-58.2	.1719+03	.2787+03	-67.0
044000	050	293	-58.4	.1711+03	.2775+03	-67.2
044100	045	291	-58.5	.1703+03	.2764+03	-67.9
044200	046	290	-58.7	.1694+03	.2752+03	-67.9
044300	049	290	-58.8	.1686+03	.2741+03	-67.9
044400	049	288	-59.0	.1678+03	.2729+03	-67.9
044500	052	289	-59.1	.1670+03	.2718+03	-67.9
044600	052	286	-59.2	.1662+03	.2707+03	-67.9
044700	054	282	-59.4	.1654+03	.2695+03	-67.9
044800	055	282	-59.5	.1646+03	.2684+03	-67.9
044900	058	281	-59.7	.1638+03	.2673+03	-67.9

TABLE 4. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M <sup>3</sup> )	DEW POINT (DEG C)
045000	064	279	-59.8	.1630+03	.2662+03	-9999.
045100	064	279	-59.9	.1622+03	.2650+03	-9999.
045200	065	278	-60.0	.1614+03	.2638+03	-9999.
045300	070	277	-60.1	.1607+03	.2627+03	-9999.
045400	075	276	-60.2	.1599+03	.2615+03	-9999.
045500	072	275	-60.2	.1591+03	.2603+03	-9999.
045600	073	279	-60.3	.1583+03	.2592+03	-9999.
045700	072	278	-60.4	.1576+03	.2580+03	-9999.
045800	072	279	-60.5	.1568+03	.2569+03	-9999.
045900	076	278	-60.6	.1560+03	.2558+03	-9999.
046000	070	282	-60.7	.1553+03	.2546+03	-9999.
046100	074	282	-60.7	.1545+03	.2534+03	-9999.
046200	072	287	-60.8	.1538+03	.2523+03	-9999.
046300	067	288	-60.8	.1530+03	.2511+03	-9999.
046400	063	289	-60.9	.1523+03	.2499+03	-9999.
046500	062	292	-60.9	.1515+03	.2487+03	-9999.
046600	058	293	-60.9	.1508+03	.2476+03	-9999.
046700	061	291	-61.0	.1501+03	.2464+03	-9999.
046800	064	290	-61.0	.1493+03	.2453+03	-9999.
046900	062	293	-61.1	.1486+03	.2441+03	-9999.
047000	059	295	-61.1	.1479+03	.2430+03	-9999.
047100	056	298	-61.2	.1472+03	.2419+03	-9999.
047200	051	298	-61.3	.1465+03	.2408+03	-9999.
047300	049	299	-61.4	.1457+03	.2398+03	-9999.
047400	047	301	-61.5	.1450+03	.2387+03	-9999.
047500	043	301	-61.6	.1443+03	.2377+03	-9999.
047600	038	300	-61.8	.1436+03	.2367+03	-9999.
047700	037	296	-61.9	.1429+03	.2356+03	-9999.
047800	039	289	-62.0	.1422+03	.2346+03	-9999.
047900	037	287	-62.1	.1415+03	.2336+03	-9999.
048000	030	297	-62.2	.1408+03	.2326+03	-9999.
048100	032	294	-62.3	.1401+03	.2316+03	-9999.
048200	030	287	-62.5	.1395+03	.2306+03	-9999.
048300	027	283	-62.6	.1388+03	.2297+03	-9999.
048400	030	294	-62.8	.1381+03	.2287+03	-9999.
048500	028	287	-62.9	.1374+03	.2277+03	-9999.
048600	026	287	-63.1	.1367+03	.2268+03	-9999.
048700	034	288	-63.2	.1361+03	.2258+03	-9999.
048800	028	290	-63.4	.1354+03	.2249+03	-9999.
048900	031	286	-63.5	.1347+03	.2239+03	-9999.
049000	031	293	-63.7	.1341+03	.2230+03	-9999.
049100	034	286	-63.9	.1334+03	.2221+03	-9999.
049200	032	298	-64.1	.1327+03	.2212+03	-9999.
049300	032	288	-64.2	.1321+03	.2203+03	-9999.
049400	028	292	-64.4	.1314+03	.2194+03	-9999.
049500	030	288	-64.6	.1308+03	.2185+03	-9999.
049600	026	293	-64.8	.1301+03	.2176+03	-9999.
049700	029	290	-65.0	.1295+03	.2167+03	-9999.
049800	029	285	-65.1	.1289+03	.2158+03	-9999.
049900	028	286	-65.3	.1282+03	.2149+03	-9999.

TABLE 4. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
050000	032	275	-65.5	.1276+03	.2141+03	-9999.
050100	028	281	-65.8	.1270+03	.2132+03	-9999.
050200	029	272	-66.0	.1263+03	.2124+03	-9999.
050300	025	269	-66.3	.1257+03	.2116+03	-9999.
050400	023	266	-66.5	.1251+03	.2108+03	-9999.
050500	027	258	-66.8	.1244+03	.2100+03	-9999.
050600	027	253	-67.0	.1238+03	.2092+03	-9999.
050700	027	246	-67.3	.1232+03	.2084+03	-9999.
050800	020	245	-67.5	.1226+03	.2076+03	-9999.
050900	027	249	-67.8	.1220+03	.2068+03	-9999.
051000	027	246	-68.0	.1214+03	.2061+03	-9999.
051100	032	244	-68.1	.1207+03	.2051+03	-9999.
051200	023	243	-68.2	.1201+03	.2042+03	-9999.
051300	020	242	-68.3	.1195+03	.2032+03	-9999.
051400	019	247	-68.4	.1189+03	.2023+03	-9999.
051500	019	247	-68.4	.1183+03	.2014+03	-9999.
051600	024	252	-68.5	.1177+03	.2004+03	-9999.
051700	022	245	-68.6	.1171+03	.1995+03	-9999.
051800	026	242	-68.7	.1165+03	.1986+03	-9999.
051900	023	239	-68.8	.1160+03	.1977+03	-9999.
052000	028	240	-68.9	.1154+03	.1968+03	-9999.
052100	030	238	-69.1	.1148+03	.1959+03	-9999.
052200	023	245	-69.3	.1142+03	.1951+03	-9999.
052300	030	240	-69.4	.1136+03	.1943+03	-9999.
052400	032	245	-69.6	.1130+03	.1935+03	-9999.
052500	032	246	-69.8	.1125+03	.1927+03	-9999.
052600	033	247	-70.0	.1119+03	.1919+03	-9999.
052700	032	252	-70.2	.1113+03	.1911+03	-9999.
052800	035	252	-70.3	.1108+03	.1903+03	-9999.
052900	030	254	-70.5	.1102+03	.1895+03	-9999.
053000	034	254	-70.7	.1096+03	.1887+03	-9999.
053100	037	261	-70.8	.1091+03	.1879+03	-9999.
053200	034	264	-71.0	.1085+03	.1870+03	-9999.
053300	031	274	-71.1	.1080+03	.1862+03	-9999.
053400	027	276	-71.3	.1074+03	.1854+03	-9999.
053500	028	283	-71.4	.1069+03	.1846+03	-9999.
053600	026	292	-71.6	.1063+03	.1838+03	-9999.
053700	024	294	-71.7	.1058+03	.1830+03	-9999.
053800	021	289	-71.9	.1052+03	.1822+03	-9999.
053900	017	281	-72.0	.1047+03	.1814+03	-9999.
054000	019	266	-72.2	.1042+03	.1806+03	-9999.
054100	017	261	-72.2	.1036+03	.1796+03	-9999.
054200	015	264	-72.1	.1031+03	.1787+03	-9999.
054300	015	278	-72.1	.1026+03	.1777+03	-9999.
054400	019	268	-72.1	.1020+03	.1768+03	-9999.
054500	025	269	-72.1	.1015+03	.1759+03	-9999.
054600	025	281	-72.0	.1010+03	.1749+03	-9999.
054700	017	298	-72.0	.1005+03	.1740+03	-9999.
054800	015	289	-72.0	.9997+02	.1731+03	-9999.
054900	012	313	-71.9	.9946+02	.1722+03	-9999.

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TABLE 4. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
055000	011	330	-71.9	.9895+02	.1713+03	-9999.
056000	003	330	-72.2	.9400+02	.1630+03	-9999.
057000	009	004	-72.0	.8929+02	.1546+03	-9999.
058000	018	036	-70.6	.8484+02	.1459+03	-9999.
059000	019	033	-68.2	.8064+02	.1371+03	-9999.
060000	021	059	-67.6	.7658+02	.1300+03	-9999.
061000	031	089	-65.8	.7295+02	.1226+03	-9999.
062000	029	092	-64.8	.6941+02	.1161+03	-9999.
063000	030	091	-64.1	.6605+02	.1101+03	-9999.
064000	024	087	-63.0	.6288+02	.1042+03	-9999.
065000	019	086	-61.3	.5988+02	.9847+02	-9999.
066000	019	067	-60.3	.5703+02	.9334+02	-9999.
067000	024	053	-59.4	.5434+02	.8856+02	-9999.
068000	031	061	-58.7	.5178+02	.8412+02	-9999.
069000	033	071	-58.7	.4935+02	.8017+02	-9999.
070000	035	079	-58.1	.4703+02	.7619+02	-9999.
071000	044	081	-57.5	.4483+02	.7242+02	-9999.
072000	043	085	-57.7	.4273+02	.6905+02	-9999.
073000	045	082	-57.2	.4074+02	.6572+02	-9999.
074000	046	079	-56.2	.3884+02	.6237+02	-9999.
075000	042	080	-55.9	.3704+02	.5939+02	-9999.
076000	045	083	-54.9	.3532+02	.5638+02	-9999.
077000	040	087	-53.2	.3372+02	.5340+02	-9999.
078000	035	090	-51.8	.3219+02	.5067+02	-9999.
079000	030	094	-50.5	.3078+02	.4810+02	-9999.
080000	025	095	-49.2	.2935+02	.4565+02	-9999.
081000	027	089	-47.9	.2802+02	.4333+02	-9999.
082000	030	098	-46.5	.2675+02	.4112+02	-9999.
083000	033	108	-45.2	.2554+02	.3903+02	-9999.
084000	030	113	-44.0	.2438+02	.3706+02	-9999.
085000	033	094	-42.9	.2328+02	.3521+02	-9999.
086000	030	109	-42.6	.2222+02	.3360+02	-9999.
087000	026	104	-42.7	.2122+02	.3207+02	-9999.
088000	025	108	-42.6	.2026+02	.3061+02	-9999.
089000	030	100	-42.3	.1934+02	.2918+02	-9999.
090000	033	097	-41.8	.1846+02	.2781+02	-9999.
091000	032	075	-41.4	.1763+02	.2650+02	-9999.
092000	033	083	-41.0	.1683+02	.2526+02	-9999.
093000	030	079	-40.7	.1607+02	.2408+02	-9999.
094000	023	070	-39.7	.1534+02	.2289+02	-9999.
095000	030	064	-37.8	.1465+02	.2168+02	-9999.
096000	028	068	-36.0	.1398+02	.2054+02	-9999.
097000	030	068	-35.0	.1335+02	.1953+02	-9999.
098000	032	072	-34.4	.1275+02	.1859+02	-9999.
099000	040	071	-33.8	.1217+02	.1771+02	-9999.
100000	050	075	-33.3	.1160+02	.1685+02	-9999.
101000	057	078	-34.2	.1109+02	.1616+02	-9999.
102000	059	076	-33.6	.1060+02	.1541+02	-9999.
103000	054	065	-32.8	.1014+02	.1469+02	-9999.
104000	045	064	-32.0	.9706+01	.1402+02	-9999.



TABLE 4. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M <sup>3</sup> )	DEW POINT (DEG C)
105000	060	081	-33.6	.9288+01	.1350+02	-9999.
106000	047	076	-33.4	.8884+01	.1291+02	-9999.
107000	050	097	-32.1	.8495+01	.1228+02	-9999.
108000	042	092	-30.9	.8132+01	.1169+02	-9999.
109000	045	078	-31.1	.7765+01	.1121+02	-9999.
110000	048	097	-0.4	.7451+01	.1069+02	-9999.
111000	040	086	-27.8	.7133+01	.1013+02	-9999.
112000	040	082	-26.3	.6839+01	.9649+01	-9999.
113000	037	096	-25.3	.6561+01	.9220+01	-9999.
114000	042	099	-24.4	.6292+01	.8811+01	-9999.
115000	052	098	-23.6	.6033+01	.8421+01	-9999.
116000	045	086	-22.9	.5790+01	.8059+01	-9999.
117000	054	082	-23.0	.5560+01	.7744+01	-9999.
118000	057	080	-23.3	.5339+01	.7443+01	-9999.
119000	062	108	-23.5	.5124+01	.7150+01	-9999.
120000	070	109	-23.7	.4917+01	.6867+01	-9999.
121000	074	107	-23.9	.4719+01	.6596+01	-9999.
122000	062	123	-24.2	.4531+01	.6347+01	-9999.
123000	057	107	-24.3	.4350+01	.6090+01	-9999.
124000	076	093	-23.7	.4178+01	.5835+01	-9999.
125000	096	090	-23.0	.4011+01	.5585+01	-9999.
126000	103	091	-22.2	.3846+01	.5338+01	-9999.
127000	089	090	-19.4	.3688+01	.5064+01	-9999.
128000	074	082	-16.2	.3538+01	.4797+01	-9999.
129000	082	083	-15.1	.3394+01	.4582+01	-9999.
130000	086	089	-14.9	.3257+01	.4394+01	-9999.
131000	041	081	-14.6	.3125+01	.4211+01	-9999.
132000	089	072	-12.3	.2999+01	.4005+01	-9999.
133000	092	073	-11.2	.2881+01	.3830+01	-9999.
134000	091	065	-10.4	.2767+01	.3669+01	-9999.
135000	099	060	-9.7	.2658+01	.3514+01	-9999.
136000	109	071	-8.9	.2551+01	.3363+01	-9999.
137000	113	084	-8.2	.2446+01	.3217+01	-9999.
138000	108	093	-6.9	.2346+01	.3069+01	-9999.
139000	097	094	-4.9	.2250+01	.2922+01	-9999.
140000	092	088	-3.0	.2160+01	.2785+01	-9999.
141000	082	086	-1.3	.2075+01	.2659+01	-9999.
142000	067	087	-1.3	.1995+01	.2557+01	-9999.
143000	070	081	-2.3	.1918+01	.2467+01	-9999.
144000	094	079	-3.2	.1843+01	.2379+01	-9999.
145000	123	086	-4.1	.1770+01	.2292+01	-9999.
146000	138	093	-3.2	.1701+01	.2196+01	-9999.
147000	131	095	-1.1	.1637+01	.2095+01	-9999.
148000	113	092	-2.3	.1574+01	.2010+01	-9999.
149000	108	088	-5.5	.1515+01	.1936+01	-9999.
150000	116	088	-8	.1457+01	.1864+01	-9999.
151000	131	090	-1.0	.1402+01	.1794+01	-9999.
152000	143	091	-1.3	.1347+01	.1727+01	-9999.
153000	150	093	-1.6	.1296+01	.1662+01	-9999.
154000	148	095	-1.8	.1247+01	.1601+01	-9999.

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TABLE 4. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
155000	185	098	-1.9	.1200+01	.1591+01	-9999.
156000	180	102	-1.7	.1155+01	.1583+01	-9999.
157000	136	106	-1.5	.1112+01	.1526+01	-9999.
158000	133	109	-1.4	.1070+01	.1372+01	-9999.
159000	131	106	-1.2	.1030+01	.1320+01	-9999.
160000	135	099	-1.1	.9920+00	.1270+01	-9999.
161000	143	092	-0.9	.9589+00	.1222+01	-9999.
162000	153	089	-0.8	.9192+00	.1176+01	-9999.
163000	150	090	-0.6	.8817+00	.1131+01	-9999.
164000	165	093	-0.8	.8515+00	.1089+01	-9999.
165000	165	096	-1.3	.8198+00	.1051+01	-9999.
166000	158	098	-1.8	.7899+00	.1014+01	-9999.
167000	152	099	-2.2	.7611+00	.9785+00	-9999.
168000	146	099	-2.7	.7332+00	.9444+00	-9999.
169000	146	099	-3.1	.7061+00	.9109+00	-9999.
170000	146	100	-3.7	.6799+00	.8790+00	-9999.
171000	148	103	-5.2	.6545+00	.8508+00	-9999.
172000	150	108	-6.3	.6301+00	.8225+00	-9999.
173000	148	112	-8.2	.6064+00	.7972+00	-9999.
174000	148	116	-9.2	.5834+00	.7698+00	-9999.
175000	148	117	-10.6	.5613+00	.7446+00	-9999.
176000	148	117	-13.9	.5398+00	.7254+00	-9999.
177000	152	115	-16.7	.5189+00	.7047+00	-9999.
178000	157	113	-15.7	.4987+00	.6749+00	-9999.
179000	165	111	-15.2	.4793+00	.6472+00	-9999.
180000	170	109	-16.8	.4607+00	.6260+00	-9999.
181000	173	107	-19.8	.4427+00	.6008+00	-9999.
182000	173	105	-21.2	.4251+00	.5877+00	-9999.
183000	173	103	-21.2	.4083+00	.5644+00	-9999.
184000	173	100	-20.2	.3922+00	.5400+00	-9999.
185000	175	098	-20.2	.3767+00	.5187+00	-9999.
186000	180	096	-18.2	.3619+00	.4945+00	-9999.
187000	185	096	-16.2	.3477+00	.4713+00	-9999.
188000	192	096	-16.2	.3342+00	.4530+00	-9999.
189000	195	096	-18.2	.3212+00	.4389+00	-9999.
190000	197	095	-22.9	.3085+00	.4294+00	-9999.
191000	195	093	-26.2	.2962+00	.4179+00	-9999.
192000	195	090	-27.2	.2842+00	.4025+00	-9999.
193000	195	087	-26.0	.2727+00	.3844+00	-9999.
194000	199	083	-24.5	.2617+00	.3666+00	-9999.
195000	204	080	-23.2	.2513+00	.3502+00	-9999.
196000	209	078	-24.2	.2412+00	.3375+00	-9999.
197000	216	077	-25.2	.2330+00	.3273+00	-9999.
198000	221	077	-26.9	.2237+00	.3165+00	-9999.
199000	228	078	-27.2	.2144	.3039+00	-9999.
200000	233	074	-27.2	.2056	.2916+00	-9999.
201000	238	079	-28.5	.1975	.2811+00	-9999.
202000	239	081	-30.0	.1895+00	.2715+00	-9999.
203000	241	082	-32.9	.1816+00	.2633+00	-9999.
204000	241	084	-35.9	.1741+00	.2557+00	-9999.

TABLE 4. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
205000	241	086	-38.6	.1667+00	.2476+00	-9999.
206000	239	087	-40.1	.1596+00	.2386+00	-9999.
207000	236	089	-40.2	.1528+00	.2285+00	-9999.
208000	231	091	-40.2	.1462+00	.2186+00	-9999.
209000	224	093	-40.2	.1400+00	.2093+00	-9999.
210000	219	096	-40.2	.1340+00	.2003+00	-9999.
211000	212	098	-41.2	.1282+00	.1925+00	-9999.
212000	204	100	-42.3	.1227+00	.1851+00	-9999.
213000	197	103	-43.8	.1174+00	.1783+00	-9999.
214000	187	105	-44.3	.1123+00	.1709+00	-9999.
215000	177	107	-45.8	.1074+00	.1646+00	-9999.
216000	167	110	-47.5	.1027+00	.1585+00	-9999.
217000	155	111	-48.9	.9910-01	.1524+00	-9999.
218000	143	112	-50.6	.9370-01	.1467+00	-9999.
219000	130	110	-52.2	.8950-01	.1411+00	-9999.
220000	119	108	-54.4	.8550-01	.1362+00	-9999.
221000	111	103	-56.0	.8160-01	.1309+00	-9999.
222000	106	096	-59.2	.7790-01	.1268+00	-9999.
223000	106	088	-60.2	.7430-01	.1215+00	-9999.
224000	111	081	-61.5	.7080-01	.1166+00	-9999.
225000	118	075	-62.2	.6750-01	.1114+00	-9999.
226000	128	071	-62.6	.6420-01	.1062+00	-9999.
227000	136	069	-64.1	.6100-01	.1017+00	-9999.
228000	145	068	-67.1	.5800-01	.9806-01	-9999.
229000	150	067	-70.1	.5520-01	.9472-01	-9999.
230000	153	068	-73.2	.5250-01	.9146-01	-9999.
231000	155	069	-75.3	.5000-01	.8803-01	-9999.
232000	153	071	-78.3	.4750-01	.8492-01	-9999.
233000	150	073	-80.3	.4500-01	.8179-01	-9999.
234000	146	076	-81.2	.4270-01	.7748-01	-9999.
235000	141	078	-82.2	.4050-01	.7387-01	-9999.
236000	136	081	-82.2	.3840-01	.7004-01	-9999.
237000	131	084	-82.3	.3640-01	.6646-01	-9999.
238000	126	087	-83.2	.3460-01	.6344-01	-9999.
239000	123	090	-83.2	.3280-01	.6014-01	-9999.
240000	119	093	-83.2	.3110-01	.5702-01	-9999.
241000	116	096	-83.4	.2940-01	.5399-01	-9999.
242000	114	098	-85.0	.2790-01	.5165-01	-9999.
243000	113	100	-85.2	.26 -01	.4911-01	-9999.
244000	111	102	-85.2	.2510-01	.4651-01	-9999.
245000	111	104	-85.5	.2380-01	.4419-01	-9999.
246000	109	105	-87.1	.2250-01	.4212-01	-9999.
247000	109	106	-88.6	.2130-01	.4020-01	-9999.
248000	109	107	-91.1	.2010-01	.3845-01	-9999.
249000	109	107	-92.6	.1900-01	.3667-01	-9999.
250000	109	107	-93.2	.1800-01	.3484-01	-9999.
251000	109	107	-94.7	.1700-01	.3318-01	-9999.
252000	109	107	-96.2	.1610-01	.3170-01	-9999.
253000	108	106	-97.2	.1520-01	.3009-01	-9999.
254000	108	105	-98.2	.1430-01	.2847-01	-9999.

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TABLE 4. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
255000	108	104	-98.2	.1360-01	.2701-01	-9999.
256000	108	103	-99.2	.1260-01	.2563-01	-9999.
257000	106	102	-99.2	.1210-01	.2423-01	-9999.
258000	106	101	-99.3	.1140-01	.2283-01	-9999.
259000	104	099	-100.2	.1080-01	.2175-01	-9999.
260000	104	098	-100.2	.1010-01	.2038-01	-9999.
261000	103	096	-100.2	.9600-02	.1933-01	-9999.
262000	103	094	-99.9	.9000-02	.1809-01	-9999.
263000	095	092	-99.1	.8657-02	.1740-01	-9999.
264000	088	090	-98.3	.8328-02	.1678-01	-9999.
265000	080	089	-97.5	.8011-02	.1610-01	-9999.
266000	073	086	-96.7	.7706-02	.1549-01	-9999.
267000	065	083	-95.9	.7413-02	.1490-01	-9999.
268000	058	080	-95.1	.7131-02	.1438-01	-9999.
269000	052	075	-94.3	.6859-02	.1379-01	-9999.
270000	045	069	-93.5	.6598-02	.1326-01	-9999.
271000	040	062	-92.8	.6347-02	.1276-01	-9999.
272000	035	052	-92.0	.6106-02	.1227-01	-9999.
273000	031	039	-91.2	.5871-02	.1181-01	-9999.
274000	030	024	-90.4	.5650-02	.1136-01	-9999.
275000	030	009	-89.6	.5433-02	.1093-01	-9999.
276000	033	355	-88.8	.5228-02	.1051-01	-9999.
277000	037	344	-88.0	.5022-02	.1011-01	-9999.
278000	036	334	-88.8	.4826-02	.0973-02	-9999.
279000	035	322	-89.6	.4617-02	.0934-02	-9999.
280000	035	309	-90.4	.4404-02	.0895-02	-9999.
281000	036	296	-91.1	.4198-02	.0854-02	-9999.
282000	040	285	-91.9	.4015-02	.0815-02	-9999.
283000	044	276	-92.6	.3847-02	.0777-02	-9999.
284000	075	273	-91.5	.3697-02	.0740-02	-9999.
285000	114	271	-90.1	.3552-02	.0704-02	-9999.
286000	157	270	-88.6	.3415-02	.0669-02	-9999.
287000	204	270	-87.2	.3282-03	.0634-02	-9999.
288000	249	270	-85.8	.3150-03	.0598-02	-9999.
289000	277	269	-84.0	.3028-03	.0563-02	-9999.
290000	283	269	-81.9	.2916-03	.0528-02	-9999.
291000	281	269	-79.7	.2814-03	.0493-02	-9999.
292000	270	269	-77.5	.2722-03	.0458-02	-9999.
293000	245	269	-75.3	.2640-03	.0423-02	-9999.
294000	201	269	-73.1	.2568-03	.0388-02	-9999.
295000	203	269	-69.5	.2506-03	.0353-02	-9999.
296000	202	269	-65.9	.2454-03	.0318-02	-9999.
297000	195	269	-62.3	.2412-03	.0283-02	-9999.
298000	177	269	-58.7	.2380-03	.0248-02	-9999.
299000	148	268	-55.1	.2348-03	.0213-02	-9999.
300000	128	268	-50.3	.2316-03	.0178-02	-9999.
301000	128	268	-44.3	.2284-03	.0143-02	-9999.
302000	125	267	-38.2	.2252-04	.0108-02	-9999.
303000	116	266	-32.2	.2220-04	.0073-02	-9999.
304000	101	264	-26.2	.2188-04	.0038-02	-9999.

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TABLE 4. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
361000	079	265	-20.0	.7258-04	.8159-04	-9999.
364000	079	263	-11.0	.6562-04	.7098-04	-9999.
367000	078	261	-1.9	.5925-04	.6175-04	-9999.
370000	075	258	7.2	.5344-04	.5372-04	-9999.
373000	069	254	16.3	.4815-04	.4673-04	-9999.
376000	061	246	25.3	.4334-04	.4093-04	-9999.
379000	050	254	35.1	.3932-04	.3612-04	-9999.
382000	048	251	45.6	.3599-04	.3198-04	-9999.
385000	045	248	56.3	.3304-04	.2841-04	-9999.
388000	043	244	67.3	.3042-04	.2531-04	-9999.
391000	040	239	78.6	.2809-04	.2263-04	-9999.
394000	038	234	90.1	.2601-04	.2029-04	-9999.
397000	037	228	101.8	.2414-04	.1825-04	-9999.
400000	035	221	113.6	.2245-04		

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TABLE 5. STS-7 FINAL ACOUSTIC/SRB DESCENT METEOROLOGICAL DATA TAPE

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M <sup>3</sup> )	DEW POINT (DEG C)
000015	003	060	31.7	.1014+04	.1145+04	25.1
001000	007	054	25.0	.0803+03	.1136+04	19.2
002000	007	063	21.0	.0946+03	.1113+04	16.4
003000	013	081	18.4	.0914+03	.1085+04	14.9
004000	017	075	16.7	.0823+03	.1053+04	14.2
005000	018	073	15.0	.0514+03	.1023+04	11.6
006000	021	057	13.5	.0821+03	.0928+03	9.2
007000	020	048	13.9	.0792+03	.0958+03	2.6
008000	016	044	12.0	.0764+03	.0931+03	-1.7
009000	013	041	11.1	.0736+03	.0915+03	-8.3
010000	011	038	9.8	.0710+03	.0873+03	-11.6
011000	005	023	8.1	.0684+03	.0848+03	-10.7
012000	003	026	6.6	.0659+03	.0820+03	-10.4
013000	005	301	4.6	.0635+03	.0796+03	-14.1
014000	008	317	3.6	.0612+03	.0770+03	-18.2
015000	005	284	1.2	.0589+03	.0748+03	-14.5
016000	011	271	-3	.0567+03	.0724+03	-17.4
017000	011	231	-1.6	.0546+03	.0707+03	-18.9
018000	006	238	-3.6	.0526+03	.0695+03	-21.8
019000	013	284	-5.0	.0502+03	.0673+03	-26.3
020000	017	297	-6.8	.0487+03	.0636+03	-28.8
021000	017	293	-8.9	.0468+03	.0617+03	-30.6
022000	018	289	-11.1	.0450+03	.0598+03	-32.3
023000	024	291	-13.6	.0432+03	.0580+03	-33.8
024000	027	289	-16.0	.0415+03	.0562+03	-26.9
025000	027	283	-18.0	.0392+03	.0546+03	-24.3
026000	021	264	-21.4	.0383+03	.0529+03	-25.0
027000	025	255	-23.7	.0367+03	.0513+03	-26.7
028000	030	269	-26.1	.0352+03	.0497+03	-28.7
029000	029	270	-28.4	.0338+03	.0481+03	-31.2
030000	034	263	-30.5	.0324+03	.0465+03	-33.9
031000	034	274	-32.3	.0310+03	.0449+03	-40.9
032000	030	287	-34.1	.0293+03	.0433+03	-43.4
033000	026	287	-37.3	.0284+03	.0420+03	-47.7
034000	028	297	-39.6	.0272+03	.0406+03	-49.4
035000	038	301	-41.9	.0260+03	.0392+03	-52.1
036000	052	301	-44.6	.0249+03	.0379+03	-54.4
037000	062	306	-47.0	.0237+03	.0365+03	-56.3
038000	064	310	-49.4	.0227+03	.0353+03	-58.5
039000	062	313	-50.4	.0216+03	.0339+03	-59.4
040000	060	320	-52.7	.0207+03	.0327+03	-61.6
041000	060	318	-55.4	.0197+03	.0315+03	-64.1
042000	049	311	-55.9	.0183+03	.0301+03	-64.9
043000	042	305	-56.9	.0175+03	.0292+03	-65.7
044000	042	294	-58.4	.0171+03	.0275+03	-67.2
045000	055	281	-59.8	.0163+03	.0262+03	-9999.
046000	068	281	-60.7	.0153+03	.0254+03	-9999.
047000	060	290	-61.1	.0147+03	.0243+03	-9999.
048000	041	295	-62.2	.0140+03	.0232+03	-9999.
049000	034	293	-63.7	.0134+03	.0223+03	-9999.

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TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M <sup>3</sup> )	DEW POINT (DEG C)
050000	034	287	-65.5	.1276+03	.2141+03	-9999.
051000	024	252	-68.0	.1213+03	.2061+03	-9999.
052000	026	243	-68.9	.1154+03	.1968+03	-9999.
053000	031	251	-70.7	.1096+03	.1887+03	-9999.
054000	024	270	-72.2	.1042+03	.1806+03	-9999.
055000	016	272	-71.9	.9895+02	.1713+03	-9999.
056000	003	330	-72.2	.9400+02	.1630+03	-9999.
057000	009	004	-72.0	.8929+02	.1546+03	-9999.
058000	018	036	-70.6	.8484+02	.1459+03	-9999.
059000	019	033	-68.2	.8064+02	.1371+03	-9999.
060000	021	059	-67.6	.7668+02	.1300+03	-9999.
061000	031	089	-65.8	.7295+02	.1226+03	-9999.
062000	029	092	-64.8	.6941+02	.1161+03	-9999.
063000	030	091	-64.1	.6605+02	.1101+03	-9999.
064000	024	087	-63.0	.6288+02	.1042+03	-9999.
065000	019	086	-61.3	.5988+02	.9847+02	-9999.
066000	019	067	-60.3	.5703+02	.9334+02	-9999.
067000	024	053	-59.4	.5434+02	.8856+02	-9999.
068000	031	061	-58.7	.5178+02	.8412+02	-9999.
069000	033	071	-58.1	.4935+02	.8017+02	-9999.
070000	035	079	-57.5	.4703+02	.7619+02	-9999.
071000	044	081	-57.7	.4483+02	.7242+02	-9999.
072000	043	085	-57.2	.4273+02	.6909+02	-9999.
073000	045	082	-56.2	.4074+02	.6572+02	-9999.
074000	046	079	-55.9	.3884+02	.6237+02	-9999.
075000	042	080	-55.2	.3704+02	.5939+02	-9999.
076000	045	083	-54.9	.3532+02	.5638+02	-9999.
077000	040	087	-53.2	.3372+02	.5340+02	-9999.
078000	035	090	-51.8	.3219+02	.5067+02	-9999.
079000	030	094	-50.5	.3074+02	.4810+02	-9999.
080000	025	095	-49.2	.2935+02	.4565+02	-9999.
081000	027	089	-47.9	.2802+02	.4333+02	-9999.
082000	030	098	-46.5	.2675+02	.4112+02	-9999.
083000	033	108	-45.2	.2554+02	.3903+02	-9999.
084000	030	113	-44.0	.2438+02	.3706+02	-9999.
085000	033	094	-42.9	.2328+02	.3521+02	-9999.
086000	030	109	-42.8	.2222+02	.3360+02	-9999.
087000	028	104	-42.7	.2122+02	.3207+02	-9999.
088000	025	108	-42.6	.2026+02	.3061+02	-9999.
089000	030	100	-42.3	.1934+02	.2918+02	-9999.
090000	033	097	-41.8	.1846+02	.2781+02	-9999.
091000	037	075	-41.4	.1763+02	.2650+02	-9999.
092000	033	083	-41.0	.1683+02	.2526+02	-9999.
093000	030	079	-40.7	.1607+02	.2408+02	-9999.
094000	023	070	-39.7	.1534+02	.2289+02	-9999.
095000	030	064	-37.8	.1465+02	.2168+02	-9999.
096000	028	068	-36.0	.1398+02	.2054+02	-9999.
097000	030	068	-35.0	.1335+02	.1953+02	-9999.
098000	032	072	-34.4	.1275+02	.1859+02	-9999.
099000	040	071	-33.8	.1217+02	.1771+02	-9999.

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TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
10000	050	075	-33.3	.1160+02	.1685+02	-9999.
10100	057	078	-34.2	.1109+02	.1616+02	-9999.
10200	059	076	-33.6	.1060+02	.1541+02	-9999.
10300	054	065	-32.8	.1014+02	.1469+02	-9999.
10400	045	068	-32.0	.9706+01	.1402+02	-9999.
10500	060	081	-33.6	.9288+01	.1350+02	-9999.
10600	047	076	-33.4	.8884+01	.1291+02	-9999.
10700	050	097	-32.1	.8495+01	.1228+02	-9999.
10800	042	092	-30.9	.8132+01	.1169+02	-9999.
10900	045	078	-27.1	.7785+01	.1121+02	-9999.
11000	048	097	-27.8	.7451+01	.1069+02	-9999.
11100	040	086	-26.3	.7133+01	.1013+02	-9999.
11200	040	082	-25.3	.6839+01	.9649+01	-9999.
11300	037	096	-24.4	.6561+01	.9220+01	-9999.
11400	042	099	-23.6	.6292+01	.8811+01	-9999.
11500	052	098	-22.9	.6033+01	.8421+01	-9999.
11600	045	086	-23.0	.5790+01	.8059+01	-9999.
11700	054	082	-23.3	.5560+01	.7744+01	-9999.
11800	057	080	-23.5	.5339+01	.7444+01	-9999.
11900	062	108	-23.7	.5124+01	.7150+01	-9999.
12000	070	109	-23.9	.4917+01	.6867+01	-9999.
12100	074	107	-24.2	.4719+01	.6596+01	-9999.
12200	062	123	-24.3	.4531+01	.6340+01	-9999.
12300	057	107	-23.7	.4350+01	.6090+01	-9999.
12400	076	093	-23.0	.4178+01	.5835+01	-9999.
12500	096	090	-22.2	.4011+01	.5585+01	-9999.
12600	103	091	-19.4	.3846+01	.5338+01	-9999.
12700	089	090	-16.2	.3688+01	.5064+01	-9999.
12800	074	082	-15.1	.3538+01	.4797+01	-9999.
12900	082	083	-14.9	.3394+01	.4582+01	-9999.
13000	086	089	-14.6	.3257+01	.4394+01	-9999.
13100	081	081	-12.3	.3125+01	.4211+01	-9999.
13200	089	072	-11.2	.2999+01	.4005+01	-9999.
13300	092	073	-10.4	.2881+01	.3830+01	-9999.
13400	091	065	-9.7	.2767+01	.3669+01	-9999.
13500	099	060	-8.9	.2658+01	.3514+01	-9999.
13600	109	071	-8.2	.2551+01	.3363+01	-9999.
13700	113	084	-6.9	.2446+01	.3217+01	-9999.
13800	108	093	-4.9	.2346+01	.3069+01	-9999.
13900	097	094	-3.0	.2250+01	.2922+01	-9999.
14000	092	088	-1.3	.2160+01	.2785+01	-9999.
14100	082	086	-0.3	.2075+01	.2659+01	-9999.
14200	067	087	-2.3	.1995+01	.2557+01	-9999.
14300	070	081	-3.2	.1918+01	.2467+01	-9999.
14400	094	079	-4.1	.1843+01	.2379+01	-9999.
14500	123	086	-3.2	.1770+01	.2292+01	-9999.
14600	138	093	-1.1	.1701+01	.2196+01	-9999.
14700	131	095	-0.3	.1637+01	.2095+01	-9999.
14800	113	092	-0.5	.1574+01	.2010+01	-9999.
14900	108	088		.1515+01	.1936+01	-9999.



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TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
150000	116	086	-0.8	.1457+01	.1964+01	-9999.
151000	131	090	-1.0	.1402+01	.1794+01	-9999.
152000	143	091	-1.3	.1347+01	.1727+01	-9999.
153000	150	093	-1.6	.1296+01	.1662+01	-9999.
154000	148	095	-1.8	.1247+01	.1601+01	-9999.
155000	145	098	-1.9	.1200+01	.1541+01	-9999.
156000	140	102	-1.7	.1155+01	.1483+01	-9999.
157000	136	106	-1.5	.1112+01	.1426+01	-9999.
158000	133	109	-1.4	.1070+01	.1372+01	-9999.
159000	131	111	-1.2	.1030+01	.1320+01	-9999.
160000	135	113	-1.1	.9920+00	.1270+01	-9999.
161000	143	116	-0.9	.9849+00	.1222+01	-9999.
162000	160	117	-0.8	.9799+00	.1176+01	-9999.
163000	165	119	-0.6	.9744+00	.1131+01	-9999.
164000	165	121	-0.6	.9699+00	.1089+01	-9999.
165000	158	123	-0.8	.9645+00	.1051+01	-9999.
166000	152	125	-1.3	.9599+00	.1014+01	-9999.
167000	146	127	-1.8	.9549+00	.9785+00	-9999.
168000	146	129	-2.2	.9499+00	.9444+00	-9999.
169000	146	131	-2.7	.9444+00	.9109+00	-9999.
170000	148	133	-3.1	.9399+00	.8790+00	-9999.
171000	150	135	-3.7	.9349+00	.8508+00	-9999.
172000	148	137	-5.2	.9301+00	.8225+00	-9999.
173000	148	139	-6.3	.9254+00	.7972+00	-9999.
174000	152	141	-8.2	.9206+00	.7698+00	-9999.
175000	157	143	-9.2	.9158+00	.7446+00	-9999.
176000	165	145	-10.6	.9110+00	.7254+00	-9999.
177000	170	147	-11.9	.9062+00	.7047+00	-9999.
178000	173	149	-16.7	.9014+00	.6749+00	-9999.
179000	173	151	-15.7	.8966+00	.6472+00	-9999.
180000	173	153	-15.2	.8918+00	.6260+00	-9999.
181000	173	155	-16.8	.8870+00	.6088+00	-9999.
182000	173	157	-19.8	.8822+00	.5877+00	-9999.
183000	175	159	-21.2	.8774+00	.5644+00	-9999.
184000	180	161	-21.2	.8726+00	.5400+00	-9999.
185000	185	163	-20.2	.8678+00	.5187+00	-9999.
186000	192	165	-20.2	.8630+00	.4945+00	-9999.
187000	195	167	-18.2	.8582+00	.4713+00	-9999.
188000	197	169	-16.2	.8534+00	.4530+00	-9999.
189000	195	171	-16.2	.8486+00	.4389+00	-9999.
190000	195	173	-18.2	.8438+00	.4294+00	-9999.
191000	195	175	-22.9	.8390+00	.4179+00	-9999.
192000	195	177	-26.2	.8342+00	.4025+00	-9999.
193000	204	179	-27.2	.8294+00	.3844+00	-9999.
194000	209	181	-26.0	.8246+00	.3666+00	-9999.
195000	216	183	-24.5	.8198+00	.3502+00	-9999.
196000	221	185	-23.2	.8150+00	.3375+00	-9999.
197000	228	187	-24.2	.8102+00	.3273+00	-9999.
198000		189	-25.2	.8054+00	.3165+00	-9999.
199000		191	-26.9	.8006+00	.3039+00	-9999.
		193	-27.2	.7958+00		

TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
20000	233	078	-27.2	.2059+00	.2916+00	-9999.
20000	238	079	-28.5	.1975+00	.2812+00	-9999.
20200	239	081	-30.0	.1895+00	.2715+00	-9999.
20300	241	082	-32.9	.1816+00	.2633+00	-9999.
20400	241	084	-35.9	.1741+00	.2557+00	-9999.
20500	241	086	-38.6	.1667+00	.2476+00	-9999.
20600	239	087	-40.1	.1596+00	.2386+00	-9999.
20700	236	089	-40.2	.1528+00	.2285+00	-9999.
20800	231	091	-40.2	.1462+00	.2186+00	-9999.
20900	224	093	-40.2	.1400+00	.2093+00	-9999.
21000	219	096	-40.2	.1340+00	.2003+00	-9999.
21100	212	098	-41.2	.1282+00	.1925+00	-9999.
21200	204	100	-42.3	.1227+00	.1851+00	-9999.
21300	197	103	-43.8	.1174+00	.1783+00	-9999.
21400	187	105	-44.3	.1123+00	.1709+00	-9999.
21500	177	107	-45.8	.1074+00	.1646+00	-9999.
21600	167	110	-47.5	.1027+00	.1585+00	-9999.
21700	155	111	-48.9	.9810-01	.1524+00	-9999.
21800	143	112	-50.6	.9370-01	.1467+00	-9999.
21900	130	110	-52.2	.8950-01	.1411+00	-9999.
22000	119	108	-54.4	.8550-01	.1362+00	-9999.
22100	111	103	-56.0	.8160-01	.1309+00	-9999.
22200	106	096	-59.2	.7790-01	.1268+00	-9999.
22300	106	088	-60.2	.7430-01	.1215+00	-9999.
22400	111	081	-61.5	.7080-01	.1166+00	-9999.
22500	118	075	-62.2	.6750-01	.1114+00	-9999.
22600	128	071	-62.6	.6420-01	.1062+00	-9999.
22700	136	069	-64.1	.6100-01	.1017+00	-9999.
22800	145	068	-67.1	.5800-01	.9806-01	-9999.
22900	150	067	-70.1	.5520-01	.9472-01	-9999.
23000	153	068	-73.2	.5250-01	.9146-01	-9999.
23100	155	069	-75.3	.5000-01	.8803-01	-9999.
23200	153	071	-78.3	.4750-01	.8492-01	-9999.
23300	150	073	-80.3	.4500-01	.8129-01	-9999.
23400	146	076	-81.2	.4270-01	.7748-01	-9999.
23500	141	078	-82.2	.4050-01	.7387-01	-9999.
23600	136	081	-82.2	.3840-01	.7004-01	-9999.
23700	131	084	-82.3	.3640-01	.6646-01	-9999.
23800	126	087	-83.2	.3460-01	.6344-01	-9999.
23900	123	090	-83.2	.3280-01	.6014-01	-9999.
24000	119	093	-83.2	.3110-01	.5702-01	-9999.
24100	116	096	-83.4	.2940-01	.5398-01	-9999.
24200	114	098	-85.0	.2790-01	.5165-01	-9999.
24300	113	100	-85.2	.2650-01	.4911-01	-9999.
24400	111	102	-85.2	.2510-01	.4651-01	-9999.
24500	111	104	-85.5	.2380-01	.4419-01	-9999.
24600	109	105	-87.1	.2250-01	.4212-01	-9999.
24700	109	106	-88.6	.2130-01	.4020-01	-9999.
24800	109	107	-91.1	.2010-01	.3845-01	-9999.
24900	109	107	-92.6	.1900-01	.3667-01	-9999.

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TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
250000	109	107	-93.2	.1800-01	.3484-01	-9999.
251000	109	107	-94.7	.1700-01	.3318-01	-9999.
252000	109	107	-96.2	.1610-01	.3170-01	-9999.
253000	108	106	-97.2	.1520-01	.3009-01	-9999.
254000	108	105	-98.2	.1430-01	.2847-01	-9999.
255000	108	104	-98.2	.1360-01	.2707-01	-9999.
256000	108	103	-99.2	.1280-01	.2563-01	-9999.
257000	106	102	-99.2	.1210-01	.2423-01	-9999.
258000	106	101	-99.3	.1140-01	.2285-01	-9999.
259000	104	099	-100.2	.1080-01	.2175-01	-9999.
260000	104	098	-100.2	.1010-01	.2034-01	-9999.
261000	103	096	-100.2	.9600-02	.1933-01	-9999.
262000	103	094	-99.9	.9000-02	.1809-01	-9999.
263000	095	092	-99.1	.8657-02	.1740-01	-9999.
264000	088	090	-98.3	.8328-02	.1674-01	-9999.
265000	080	089	-9.5	.8011-02	.1610-01	-9999.
266000	073	086	-96.7	.7706-02	.1549-01	-9999.
267000	065	083	-95.9	.7413-02	.1490-01	-9999.
268000	058	080	-95.1	.7131-02	.1434-01	-9999.
269000	052	075	-94.3	.6859-02	.1379-01	-9999.
270000	045	069	-93.5	.6598-02	.1326-01	-9999.
271000	040	062	-92.8	.6347-02	.1276-01	-9999.
272000	035	052	-92.0	.6106-02	.1227-01	-9999.
273000	031	039	-91.2	.5873-02	.1181-01	-9999.
274000	030	024	-90.4	.5650-02	.1136-01	-9999.
275000	030	009	-89.6	.5435-02	.1093-01	-9999.
276000	033	355	-88.8	.5228-02	.1051-01	-9999.
277000	037	344	-88.0	.5029-02	.1011-01	-9999.
280000	036	334	-88.8	.4269-02	.8043-02	-9999.
283000	035	322	-89.6	.3617-02	.6844-02	-9999.
286000	035	309	-90.4	.3064-02	.5823-02	-9999.
289000	036	296	-91.1	.2595-02	.4954-02	-9999.
292000	040	285	-91.9	.2198-02	.4215-02	-9999.
295000	044	276	-92.6	.1862-02	.3587-02	-9999.
298000	075	273	-91.5	.1597-02	.3048-02	-9999.
301000	114	271	-90.1	.1352-02	.2556-02	-9999.
304000	157	270	-86.6	.1145-02	.2143-02	-9999.
307000	204	270	-87.2	.9692-03	.1798-02	-9999.
310000	249	270	-85.8	.8206-03	.1507-02	-9999.
313000	277	265	-84.0	.6985-03	.1268-02	-9999.
316000	283	269	-81.9	.5986-03	.1071-02	-9999.
319000	281	269	-79.7	.5130-03	.9041-03	-9999.
322000	270	269	-77.5	.4395-03	.7634-03	-9999.
325000	245	269	-75.3	.3765-03	.6446-03	-9999.
328000	201	269	-73.1	.3225-03	.5443-03	-9999.
331000	203	269	-69.5	.2790-03	.4614-03	-9999.
334700	202	269	-65.9	.2414-03	.3912-03	-9999.
337000	195	269	-62.3	.2088-03	.3317-03	-9999.
340000	177	269	-58.7	.1805-03	.2812-03	-9999.
343000	148	268	-55.1	.1560-03	.2385-03	-9999.

TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
346000	128	268	-50.3	.1363-03	.2032-03	-9999.
349000	128	268	-44.3	.1203-03	.1741-03	-9999.
352000	125	267	-38.2	.1061-03	.1491-03	-9999.
355000	116	266	-32.2	.9352-04	.1277-03	-9999.
358000	101	264	-26.2	.8237-04	.1094-03	-9999.
361000	079	265	-20.0	.7258-04	.9378-04	-9999.
364000	079	263	-11.0	.6562-04	.8159-04	-9999.
367000	078	261	-1.9	.5925-04	.7098-04	-9999.
370000	075	258	7.2	.5344-04	.6175-04	-9999.
373000	069	254	16.3	.4815-04	.5372-04	-9999.
376000	061	246	25.3	.4334-04	.4673-04	-9999.
379000	050	254	35.1	.3932-04	.4093-04	-9999.
382000	048	251	45.6	.3599-04	.3612-04	-9999.
385000	045	248	56.3	.3308-04	.3196-04	-9999.
388000	043	244	67.3	.3042-04	.2841-04	-9999.
391000	040	239	78.6	.2809-04	.2531-04	-9999.
394000	038	234	90.1	.2601-04	.2263-04	-9999.
397000	037	228	101.8	.2414-04	.2029-04	-9999.
400000	035	221	113.6	.2245-04	.1825-04	-9999.

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TABLE 6. SELECTED ATMOSPHERIC OBSERVATIONS FOR THE FLIGHT TESTS OF THE SPACE SHUTTLE VEHICLES

Vehicle Data				Surface Observations				Inflight Conditions Max. Wind Below 60,000 ft			Count Down and Launch Comments of Meteorological Significance		
Seq. No.	Vehicle No.	Launch Date	Time <sup>c</sup> Nearest Minute	Launch Pad	Thermodynamic <sup>a</sup>		Wind <sup>b</sup>		Alt. (ft)	Speed (ft/sec)		Dir. (deg)	
					Press <sup>d</sup> N/cm <sup>2</sup>	Temp. (°C)	Rel. Hum. (%)	Speed (ft/sec)					Dir. (deg)
1	STS-1 Columbia	4/12/81	0700	39A	10.234 <sup>e</sup>	21	82	11.8 15.2	125 120	44,300	98	250	Wind directional change observed at Pad just prior to L+0. <sup>g</sup>
2	STS-2 Columbia	11/12/81	1010	39A	10.166	23	61	27.0 27.0	345 355	36,300	153	286	
3	STS-3 Columbia	3/22/82	1100	39A	10.160	24	71	7.0 <sup>f</sup> 8.0 <sup>f</sup>	50 <sup>f</sup> 145 <sup>f</sup>	45,000	119	250	
4	STS-4 Columbia	6/27/82	1100 <sup>h</sup>	39A	10.200	29	70	5.8 <sup>i</sup> 4.9 <sup>i</sup>	133 <sup>i</sup> 141 <sup>i</sup>	47,900	37	329	
5	STS-5 Columbia	11/11/82	0719	39A	10.227	22	68	22.0 35.0	90 90	40,600	146	336	
6	STS-6 Challenger	4/4/83	1330	39A	10.183	23	55	12.7 16.4	63 55	46,100	155	277	
7	STS-7 Challenger	6/18/83	0733 <sup>h</sup>	39A	10.146	25	80	5.9 <sup>f</sup> 10.3 <sup>f</sup>	10 <sup>f</sup> 350 <sup>f</sup>	45,900	76	278	

a. Pad 39A thermodynamic measurements taken at approximately 1.2 m (4 ft) above natural grade at camera site No. 3

b. 1 min average prior to L+0 of 60 ft PLP (listed first) and 275 ft FSS winds measured above natural grade.

c. Eastern Standard Time unless otherwise noted.

d. Pressure measurement applicable to 21 ft above MSL unless otherwise indicated.

e. Pressure measurement applicable to 14 ft above MSL.

f. 10 sec average prior to L+0.

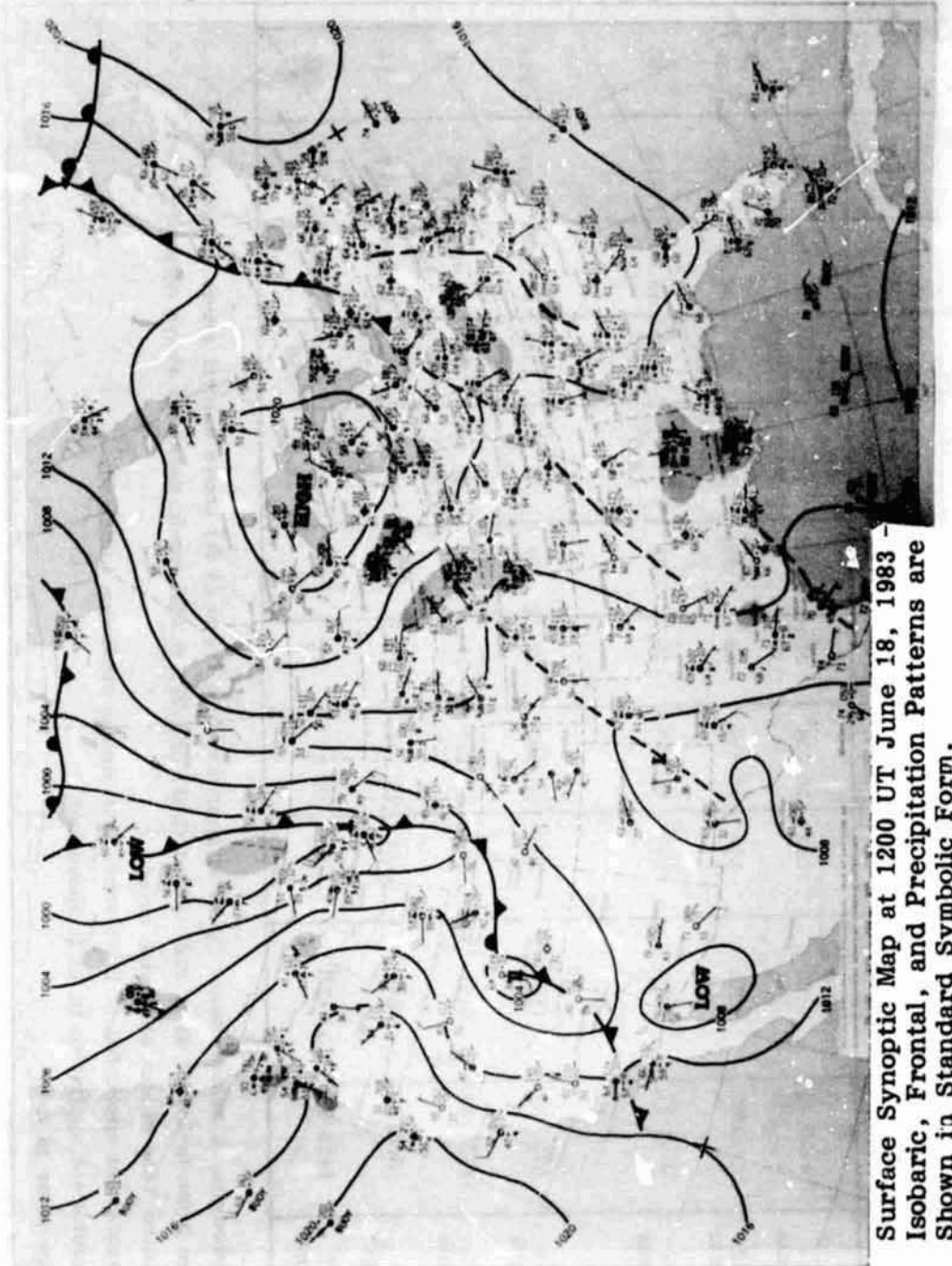
g. Due to onset of sea breeze.

h. Eastern Daylight Time.

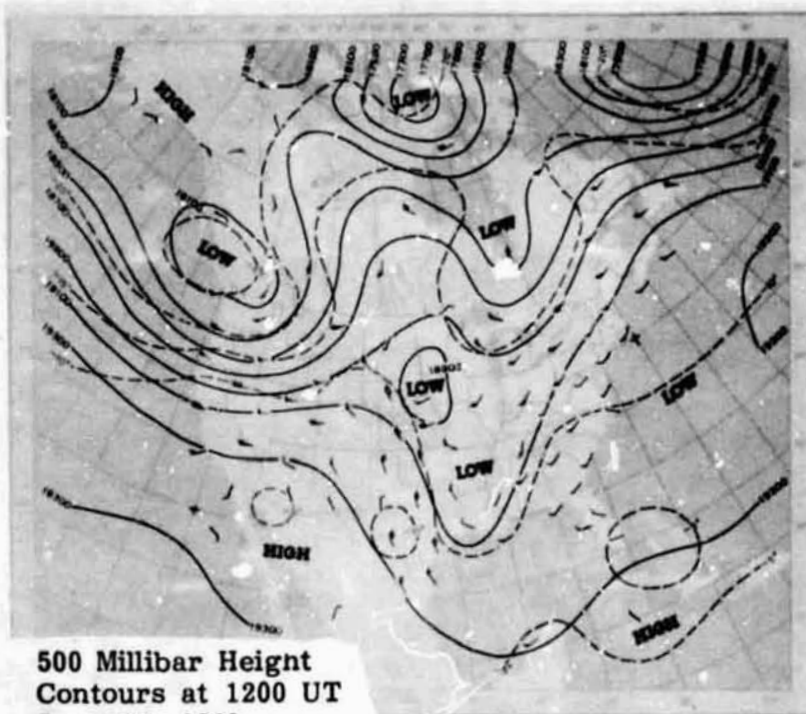
i. 30 sec average prior to L+0.

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500 Millibar Height  
Contours at 1200 UT  
June 18, 1983.

Continuous Lines Indicate Height Contours In  
Feet Above Sea Level. Dashed Lines are Isotherms  
In Degrees Centigrade. Arrows Show Wind Direction  
and Speed at the 500 ML Level.

Figure 2. 500 mb map 27 min after launch of STS-7.

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Figure 3. GOES-5 visible imagery of cloud cover 3 min prior to launch of STS-7 (1130 UT, June 18, 1983). 500-mb contours and wind barbs are also included for 1200 UT.



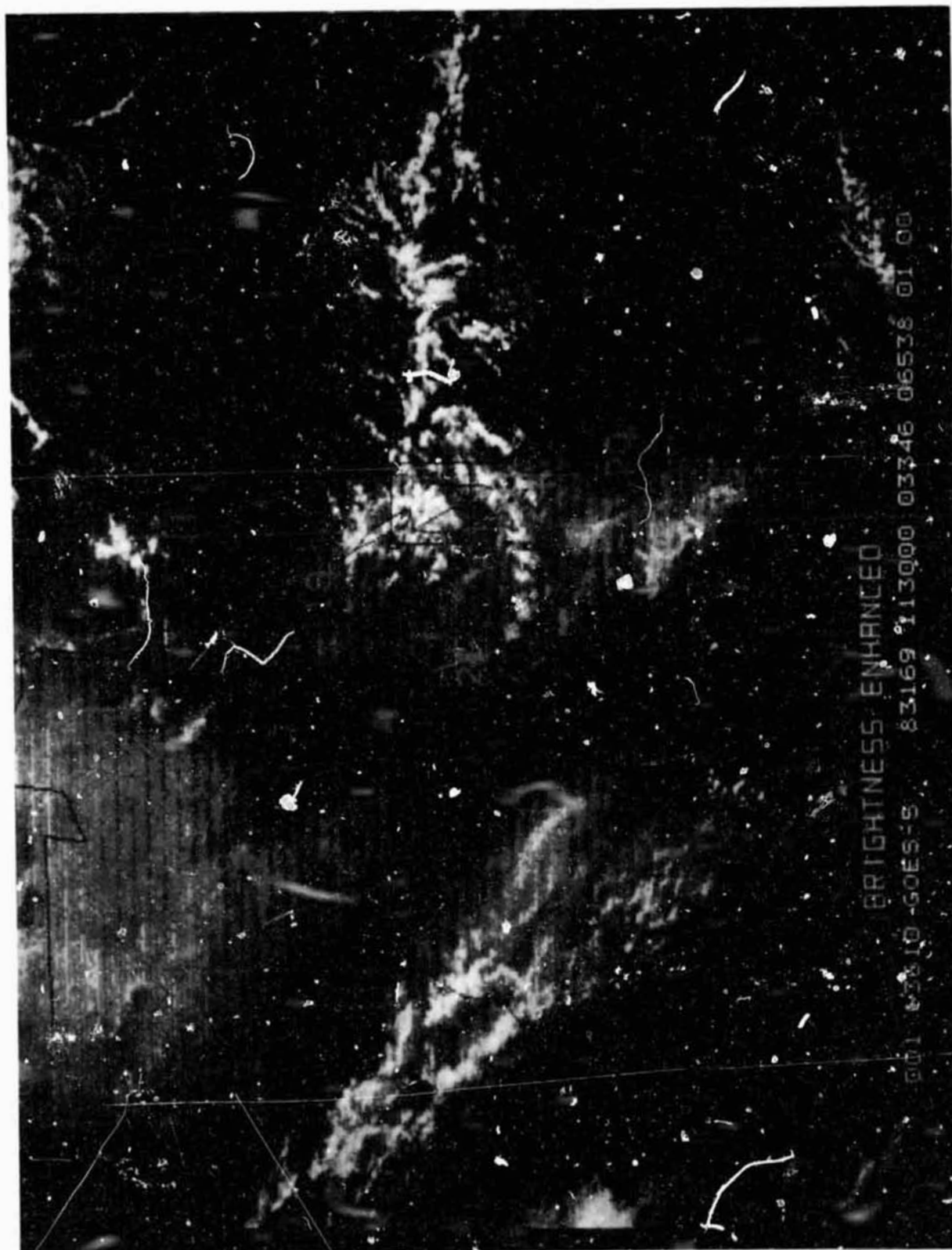


Figure 4. Enlarged view of GOES-5 visible imagery of cloud cover 3 min prior to launch of STS-7 (1130 UT, June 18, 1983). Surface temperature and wind barbs for 1100 UT are also included.

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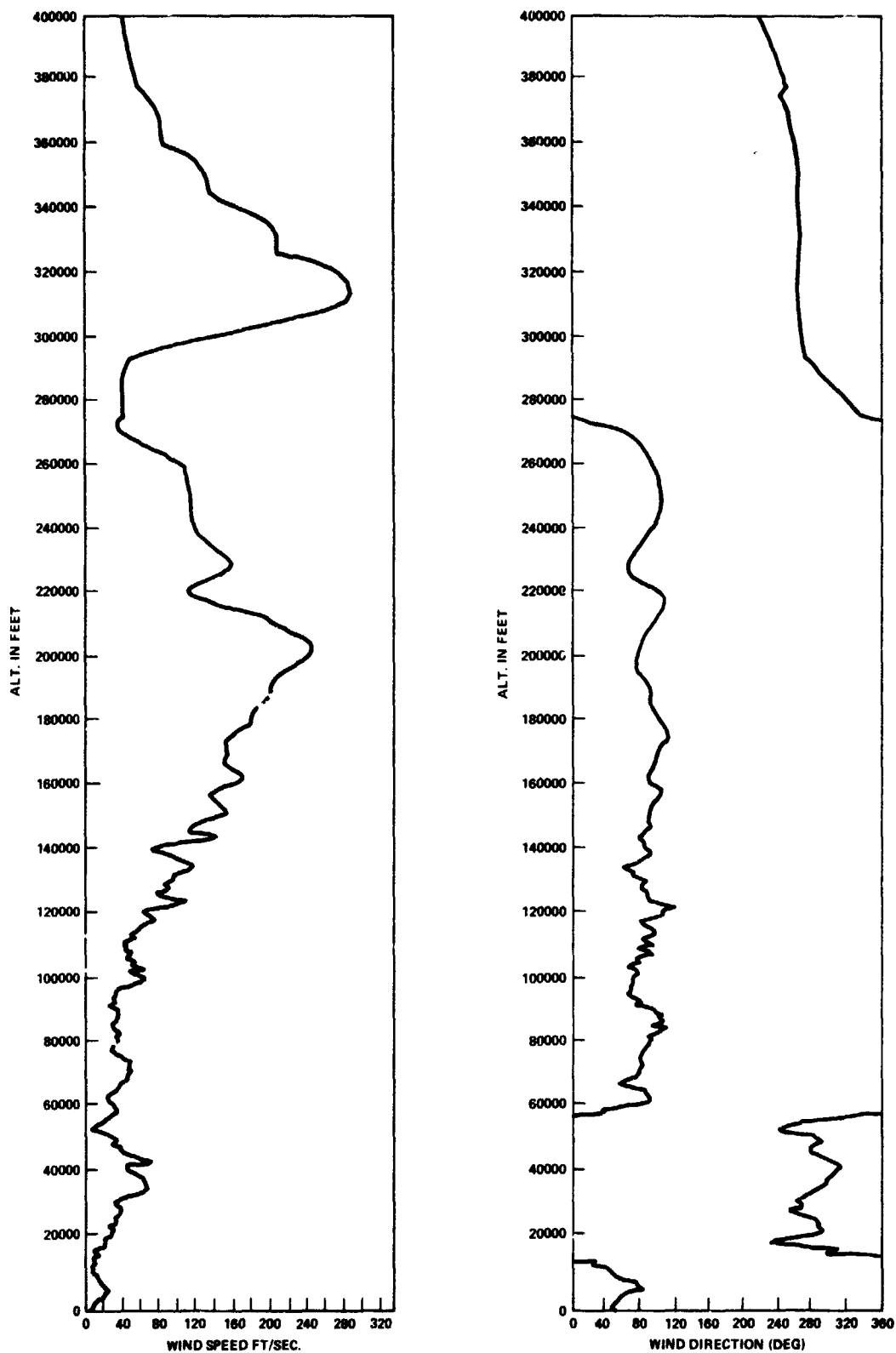


Figure 5. Scalar wind speed and direction at launch time of STS-7.

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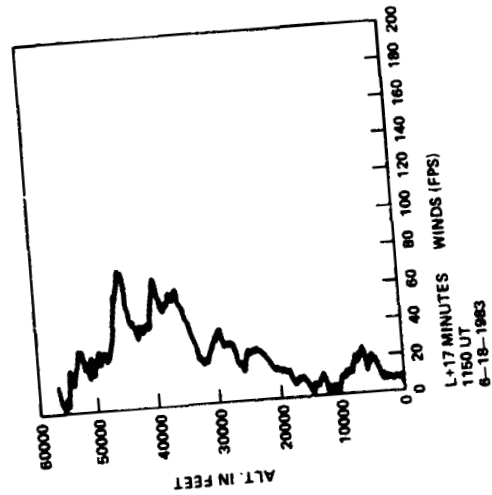
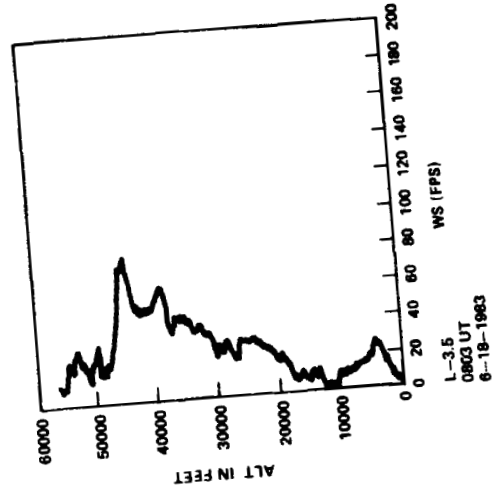
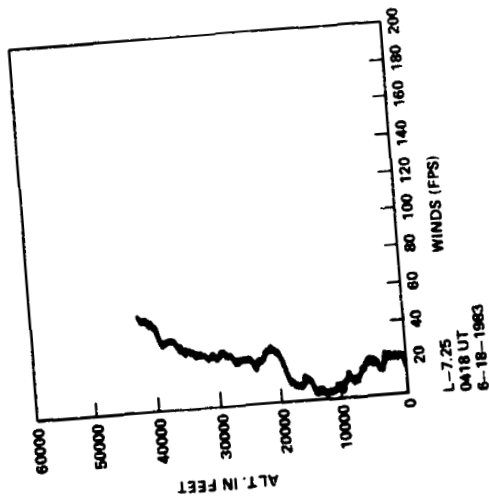
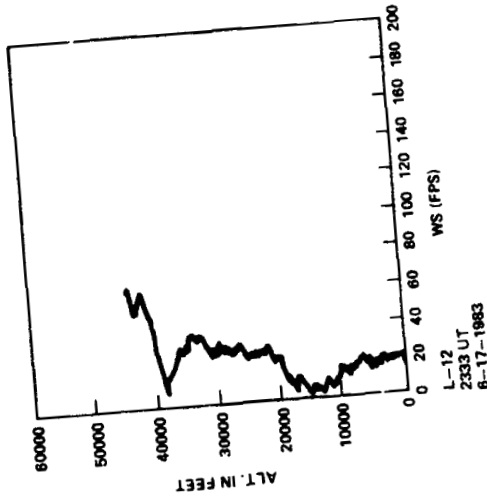
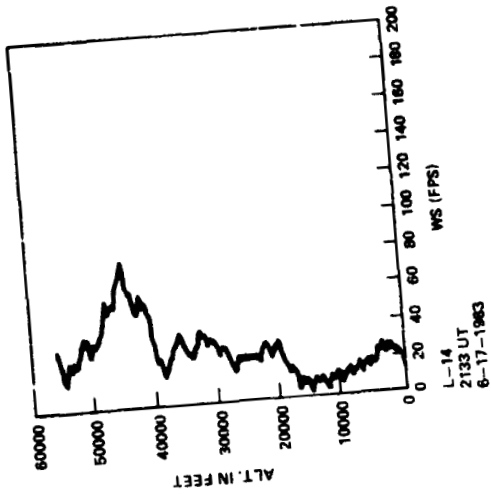
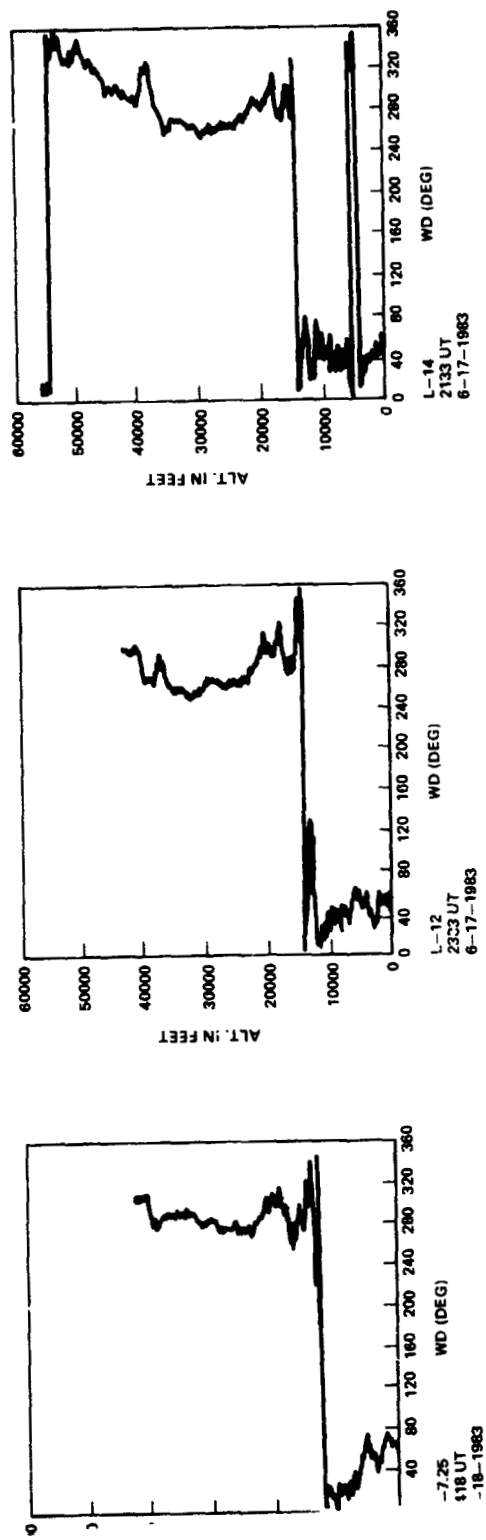


Figure 6. STS-7 prelaunch/launch Jimsphere-measured wind speeds (FPS).



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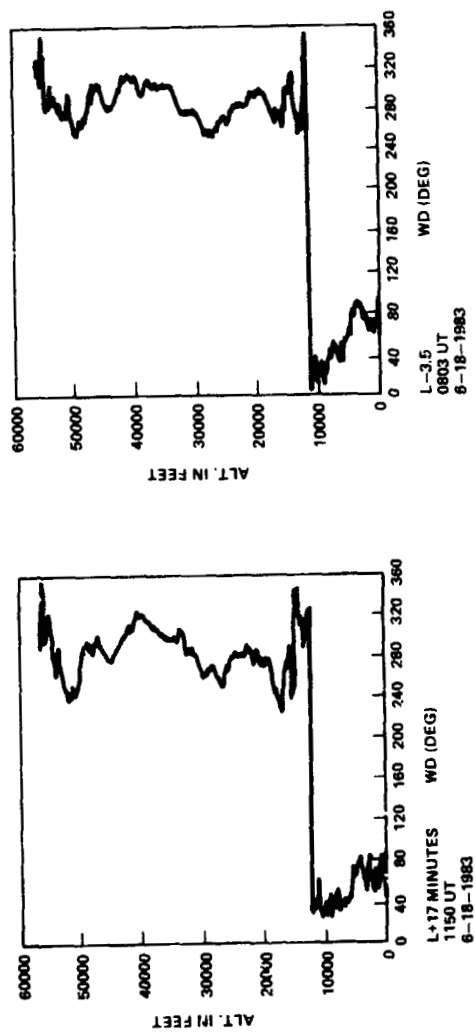
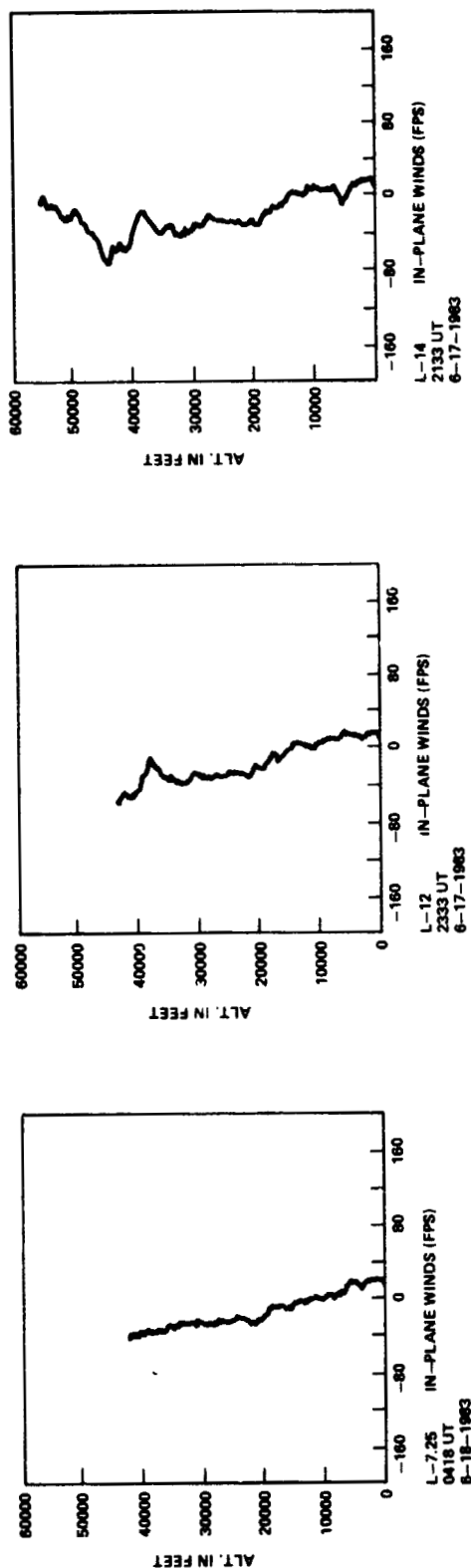


Figure 7. STS-7 prelaunch/launch Jimphere-measured wind directions (degrees).



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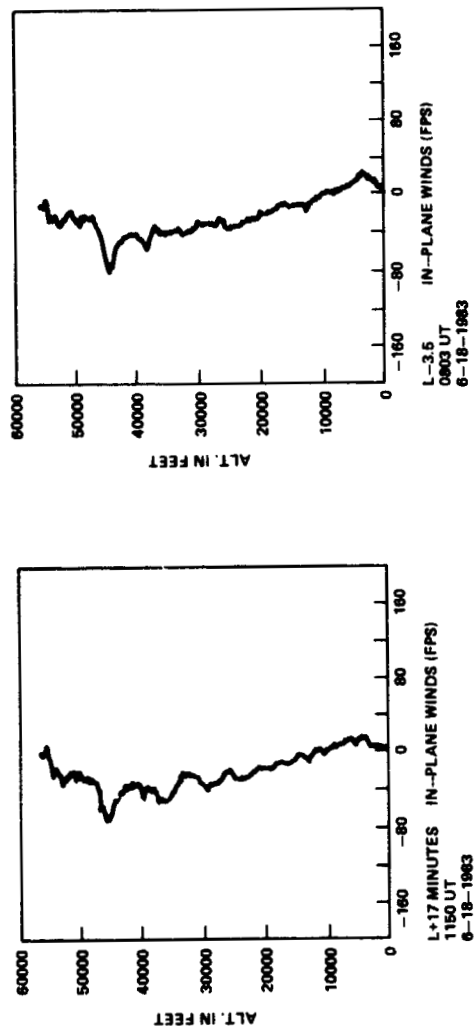


Figure 8. STS-7 prelaunch/launch Jimsphere-measured in-plane component winds (FPS).  
Flight azimuth = 90 degrees.

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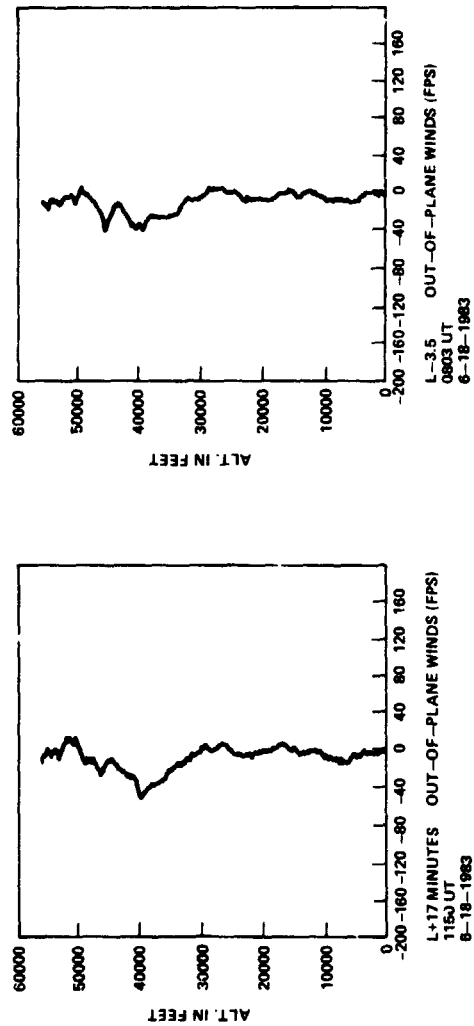
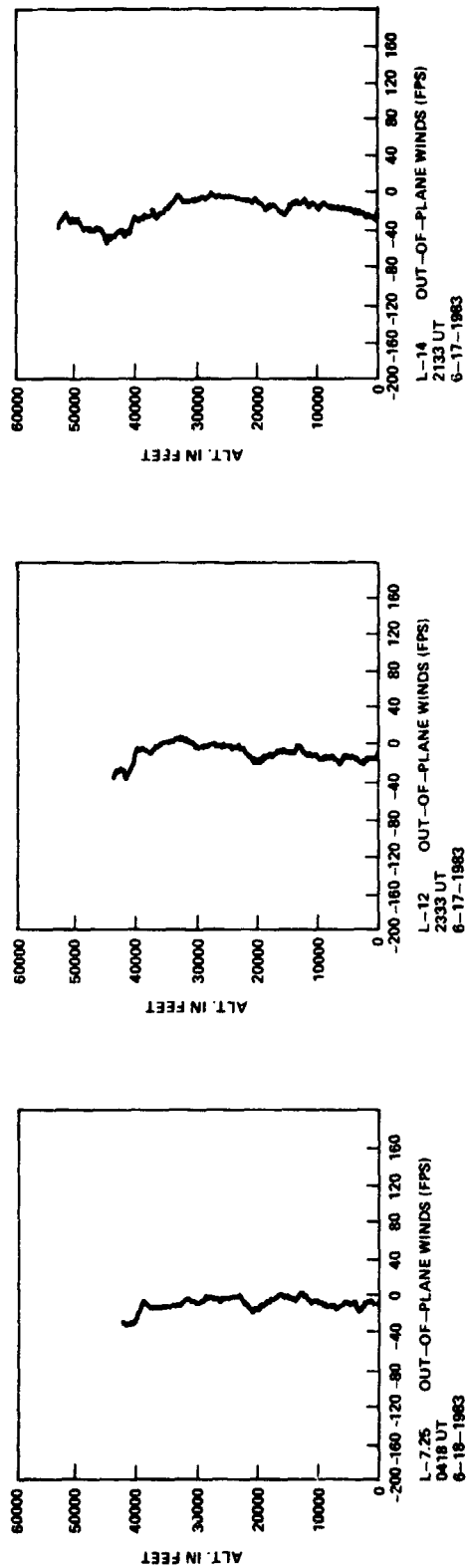
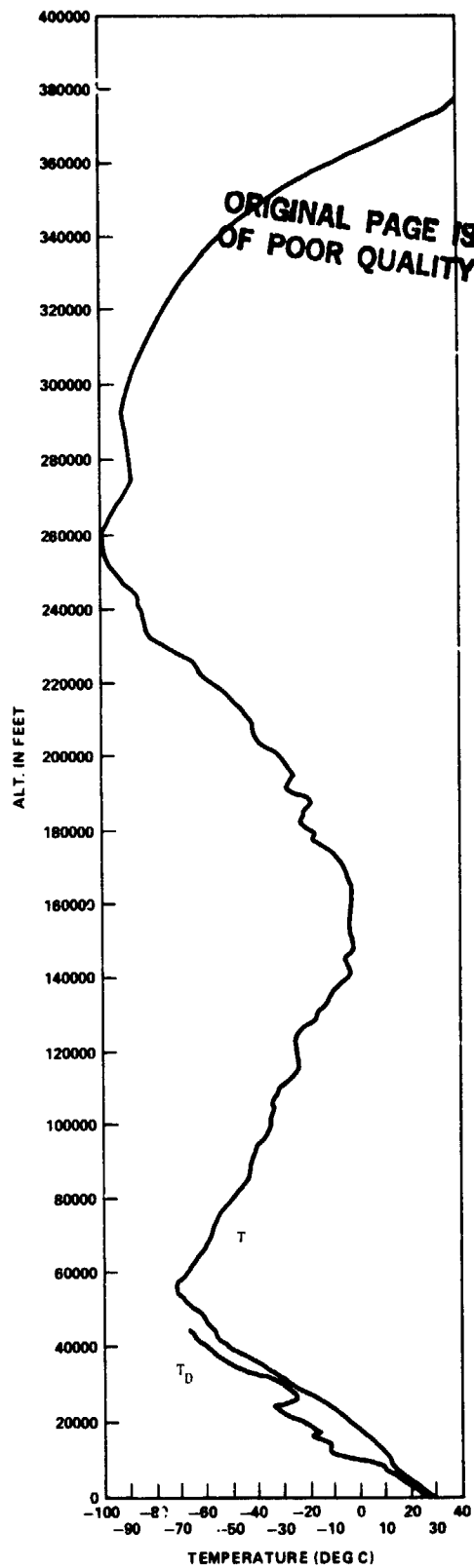
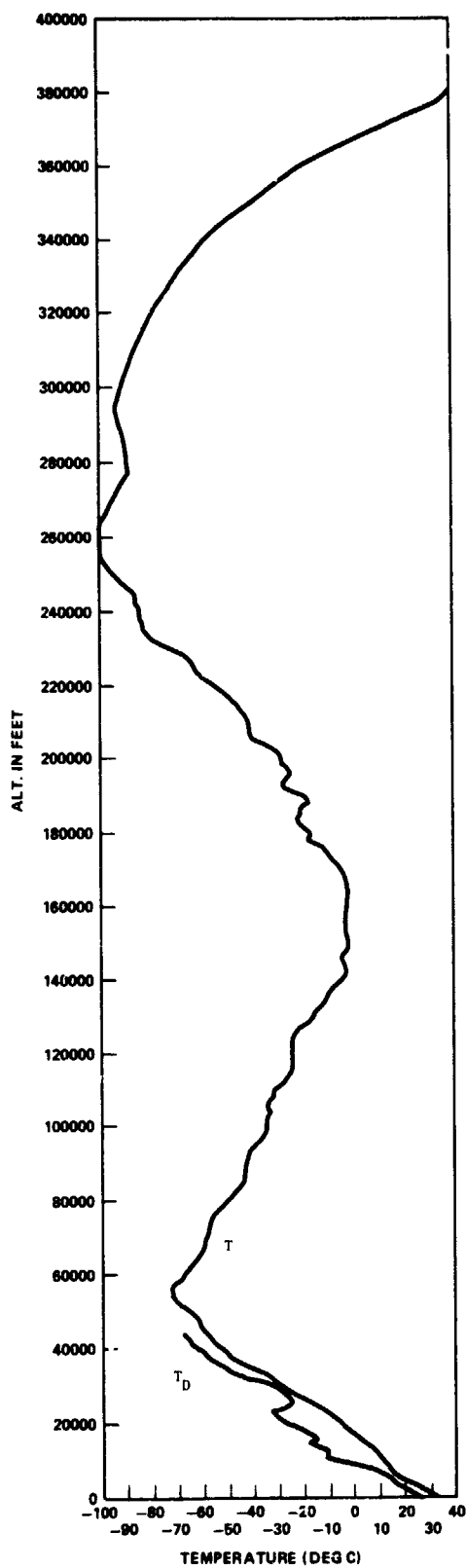


Figure 9. STS-7 prelaunch/launch Jimsphere-measured out-of-plane component winds (FPS).  
Flight azimuth = 90 degrees.



T - Temperature  
T<sub>D</sub> - Dew point temperature

Figure 10. STS-7 temperature profiles versus altitude for launch (left) and Acoustic/SRB descent (right).

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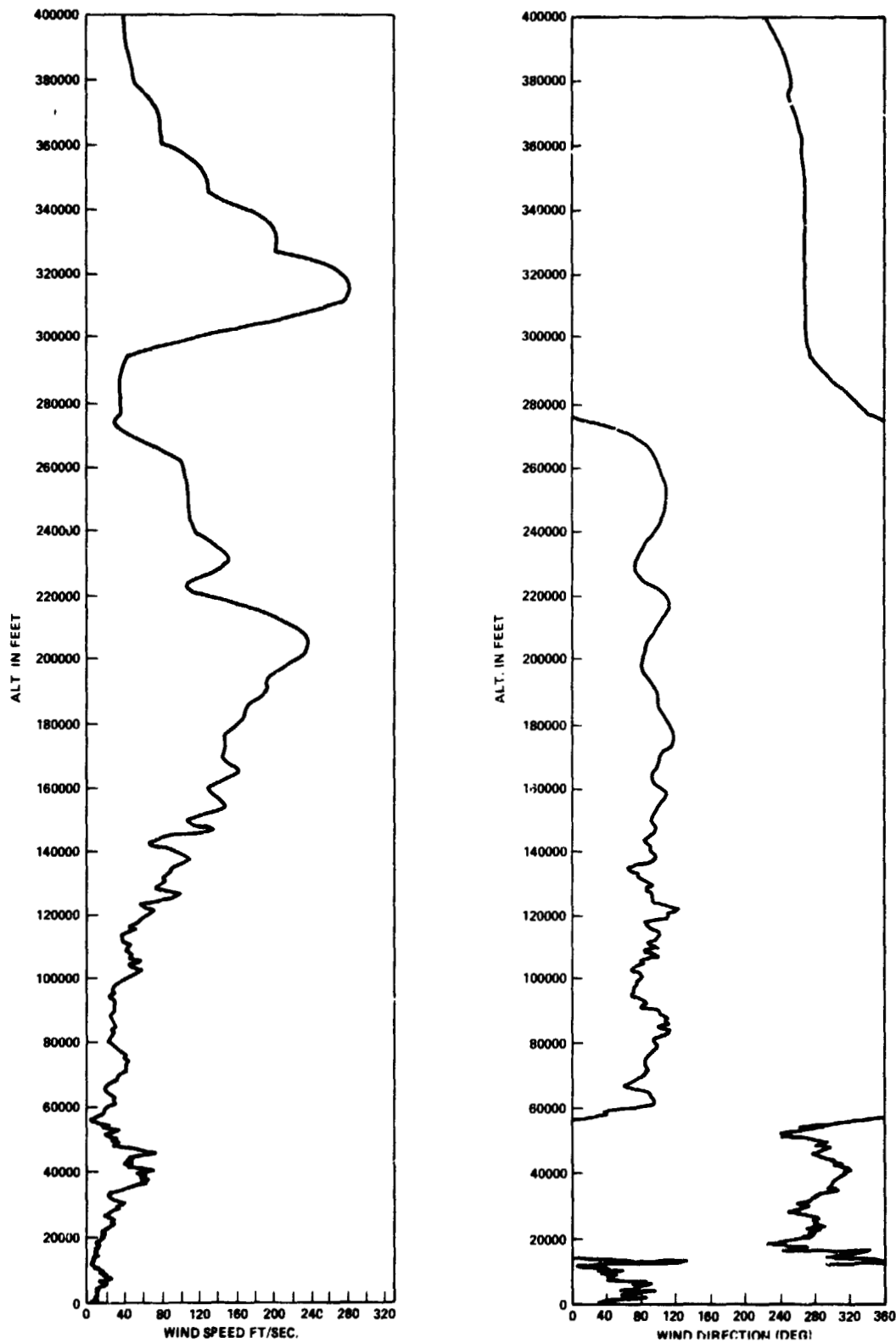


Figure 11. STS-7 scalar wind speed and direction for Acoustic/SRB descent.



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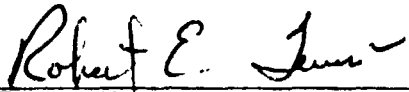
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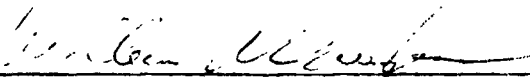
## ATMOSPHERIC ENVIRONMENT FOR SPACE SHUTTLE (STS-7) LAUNCH

By D. L. Johnson, C. K. Hill, and G. W. Batts

The information in this report has been reviewed for technical content. Review of any information concerning Department of Defense or nuclear energy activities or programs has been made by the MSFC Security Classification Officer. This report, in its entirety, has been determined to be unclassified.



R. E. Turner  
Chief, Atmospheric Effects Branch



W. W. Vaughan  
Chief, Atmospheric Sciences Division



G. F. McDonough  
Director, Systems Dynamics Laboratory